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The Oliver-Sharpey Lectures

ON

THE ELECTRICAL ACTION OF THE HUMAN HEART.

Delivered before the Royal College of Physicians of London on April 8th and 10th, 1913,

BY A. D. WALLER, M.D. ABERD., F.R.S.,

DIRECTOR OF THE PHYSIOLOGICAL LABORATORY OF THE UNIVERSITY OF LONDON.

LECTURE I.

Delivered on April 8th.

MR. PRESIDENT,—I may not expend too many of the minutes of my too short hour upon matters other than of strict business. But my strict business has this moment been interrupted by a gift that I value exceedingly, that of a portrait of Sharpey in his prime, side by side with his life-long friend, Allen Thomson. I am very grateful to Allen Thomson's son, Professor John Millar Thomson, for this gift, which recalls to my mind early memories of kindly advice given in 1874 by a wise master to a raw boy, and of still earlier table talk about the days when another Augustus Waller used to consult William Sharpey about the emigration of leucocytes and the action of the vago-sympathetic and the degeneration of nerves. And now that I see before me other pupils of William Sharpey—yourself, Sir, and George Oliver, the founder of these commemorative lectures—a teacher of us all in matters relating to the blood pressure in health and disease—I am again reminded that time passes but too quickly, and that it is a great honour for the raw boy of 1874 to follow in the footsteps of Sharpey and of Oliver.

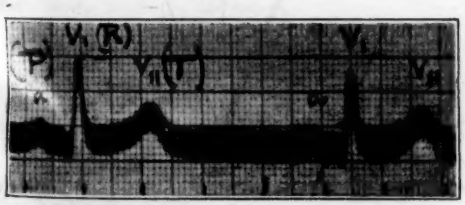
DEMONSTRATION OF THE CARDINAL FACTS.

The vertical spot of light upon the transparent screen in front of you is reflected from a minute mirror fixed to a stirrup of fine platinum wire in a powerful electro-magnetic field, and when a current of electricity traverses the wire—up one limb, down the other—the mirror and the reflected beam of light are deflected to your right and left. The apparatus is, in fact, a galvanometer or—if a condenser of large capacity be placed in circuit—an electrometer in one of its latest and most convenient forms. It is called an oscillograph.

Now that I dip my two hands into these two jars of saline which are connected with the two poles of the oscillograph, you see the spot of light sharply deflected in a rhythm which is obviously that of the pulse. Looking closely you see that each movement appears to be double; the two movements being what I designate as the first and second ventricular peaks, V_1 and V_{11}. The first and quickest which appears on the screen as a flash of the moving light I usually refer to as the systolic spike.

The two chief features (and one other—viz., a presystolic

FIG. 1.



Electrocardiogram of a normal person recorded by a string galvanometer. *a* = auricular or presystolic (= P). V_I = first ventricular or the "systolic spike" (= R). V_{II} = second ventricular (= T). Time in one-fifth second.

wavelet due to the auricular contraction) are fixed and made quite obvious by means of photography, the technique of which need not be considered. As a result we have on the developed record an electrocardiogram presenting three chief features.

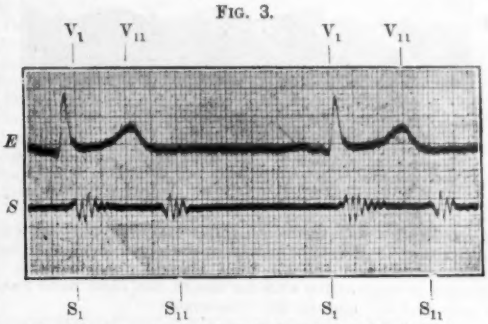
I do not think it necessary or convenient to follow the rubric P, Q, R, S, T, and U, introduced by Einthoven. But as it is a customary rubric I have given in Fig. 1 the comparison between the two systems. Naturally I prefer my own rubric as being simpler and closer to the facts. I have used it for the last 20 years, and shall continue to do

FIG. 2.

Electrocardiogram of a normal person recorded by an oscillograph.

so, partly because I find a difficulty in instantly recalling the application of the several letters of the other and newer rubric, partly because I hold that the simpler rubric keeps closer to the facts of the heart's cycle. The best justification of this simple nomenclature—first and second ventricular—is, however, to be found in simultaneous records of the sounds, where obviously first and second ventricular peaks of

FIG. 3.



Simultaneous record by M. L. Bull of the electrical effects *E* and of the sounds *S* associated with the beat of the human heart. The first and second sounds immediately succeed the first and second ventricular peaks. Time in one-fifth second.

the electrocardiogram correspond with first and second sounds of the phonogram. (Fig. 3.)

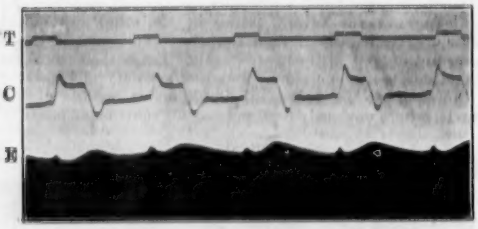
And this primitive record (Fig. 4), taken in 1887, of the movements of the capillary electrometer recorded simultaneously with the "apex-beat" cardiogram shows the same thing, in spite of the fact that the electrical effects, by reason of reversed pole connexions, were recorded downwards instead of upwards, as has now become the usual custom. With the more sluggish electrometer the auricular wavelet is not shown, but only the first and second ventricular waves, which are very nearly synchronous with the beginning and end of the ventricular systole. And with this instrument the first ventricular wave, which is very rapid, is comparatively small. But with a more rapidly acting instrument, such as a string galvanometer, it is tall as well as of short duration. We shall find it convenient to refer to this first ventricular wave as the systolic spike, and we shall learn to recognise this spike as a landmark in otherwise complicated records.

The electrical pulsations now visible to you on the screen are, of course, not the effect of any electrical currents applied to the body. They are caused by the contracting heart. And the fear that I have heard expressed, that the enfeebled heart of a hospital patient might be unable to bear such strong currents is entirely unfounded; nor is there better foundation for the fear lest an enfeebled heart be further exhausted by giving off electricity to the galvanometer. Neither are these pulsations in any degree due to the mere mechanical effect of the arterial pulse. The readiest proof of this—and at the same time a demonstration of the contrast between a favourable lead and an unfavourable lead—is given by the following experiment. Taking one of

the electrodes in my mouth—and for this experiment I must stop talking for a moment, because the movements of my tongue would interfere with the result—and dipping first my left and then my right hand into a vessel serving as the other electrode, pulsation will be clearly visible in the first, but not at all or very slightly visible in the second case. With the mouth and left hand we have a *favourable* or *strong* lead; with the mouth and right hand an *unfavourable* or *weak* lead.

This demonstration of the difference between the right and left sides might be completed by further experiments, showing, firstly, that there is hardly any effect when the right and left foot are led off to the galvanometer—i.e., that the two feet in this connexion are practically iso-electric; and, secondly, that if we lead off either of these two iso-electric parts—i.e., either foot in combination first with the right hand, then with the left hand—a difference is observable between these two cases similar to, if less pronounced than, the difference between the two hands taken

FIG. 4.



Simultaneous record of the apex beat C and of the electrical response E. The cardiogram C was recorded by the shadow of the lever of a Marey tambour. The electrical response is indicated by the shadow of the column of mercury in a Lippmann electrometer; the double movement with each systole is ventricular. T, Time in seconds. From the *Journal of Physiology*, vol. viii., 1887, p. 229.

in combination with the mouth. But taken in combination with either of the two feet it is the *right* hand that is "favourable" and the *left* hand that is "unfavourable," whereas in combination with the mouth the *right* hand was "unfavourable" and the *left* "favourable."

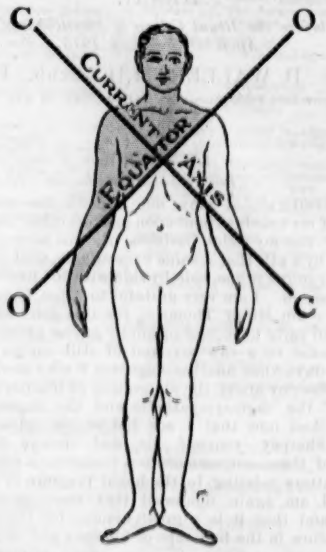
SYSTEM OF LEADS.

In review of all these facts I may now point to the following tabular summary giving the ten possible leads between mouth and extremities taken two by two, and the geometrical figure (Fig. 6) giving the five leads to which for all practical purposes these ten leads are reducible. The designations "right and left superior," "right and left lateral," "axial" and "equatorial" will, no doubt, be understood by the use I shall make of them, and they do not need therefore any formal explanation.

Lead I.*	Right hand and left hand	=	Transverse.
,, II.*	,, ,, ,, ,, foot	=	Axial.
,, III.	Left ,, ,, ,, ,,	=	Left lateral.
,, IV.*	Right ,, ,, right foot	=	Right ,,
,, V.	Left ,, ,, ,, ,,	=	Equatorial.
,, VI.	Right foot ,, left ,,	=	Inferior.
,, VII.*	Mouth and left hand	=	Left superior.
,, VIII.	,, ,, right ,,	=	Right ,,
,, IX.*	,, ,, left foot	=	Left inferior.
,, X.*	,, ,, right ,,	=	Right ,,

In my first investigation of the matter in 1887[1] I felt it necessary to study each and all of these ten leads, and I then divided them into two groups—favourable or *strong* leads, the starred cases in the list; unfavourable or *weak* leads, the unstarred cases. The former were the cases where each of the two led-off points were on opposite sides of the equator, or otherwise expressed, in accordance of direction with the current-axis. (Fig. 5.) I did not fail to observe in

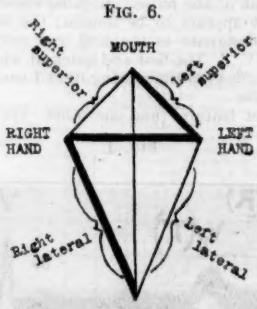
FIG. 5.



the course of that first survey that Lead VI.—i.e., the two feet—is the weakest of all, so much so, indeed, that for all practical purposes they may be regarded as iso-electric; and consequently Leads III. (left lateral) and V. (equatorial) were practically equivalent; also Leads II. (axial) and IV. (right lateral). As regards the four mouth leads, I observed no very marked difference of magnitude in the three strong leads, and for the purpose of further study of the effects on the two sides of the body I therefore confined my attention to the left and right superior—Leads VII. and VIII. of the list.

My system of leads was thus reduced to five—viz., transverse, right and left superior, right and left lateral, represented by the geometrical figure, which explains

FIG. 6.



The five leads—one across, two above, and two below. "Strong" leads are indicated by thick lines, "weak" leads by thin lines.

itself, and which I shall utilise for the further explanation of the calculation of the direction of the cardiac current axis. (Fig. 6.)

And now it must be evident to anyone familiar with Einthoven's three leads that, leaving out of account the two superior leads, the other three leads—transverse, left and right lateral—form a trio practically equivalent to Einthoven's trio—transverse, axial and left lateral. Practically it matters very little which of these two trios we

[1] Waller: On the Electromotive Changes Connected with the Beat of the Mammalian Heart and of the Human Heart in Particular, Philosophical Transactions of the Royal Society, p. 169, 1889.

[2] Einthoven: Ueber die Form des Menschlichen Electrocardiogramms, Pflüger's Archiv, vol. lx., p. 101, 1895. Weiteres über das Electrocardiogramms, Pflüger's Archiv, vol. cxxii., p. 517, 1908. In his latest paper Einthoven has described a method of measuring the cardiac angles based on physical considerations that cannot be discussed here, but must be studied from the paper itself. (W. Einthoven, G. Fahr und A. de Waart, Ueber die Richtung und die manifeste Grösse der Potentialschwankungen im menschlichen Herzen und über den Einfluss der Herzlage auf die Form des Elektrokardiogramms, Pflüger's Archiv, vol. cl., p. 275, 1913.)

may choose for observation. I prefer my own trio, because I have become used to it, and because it affords better and simpler thinking material for picturing to oneself the balance of potentials and the direction of currents on the two sides of the body, and because it leads quite naturally to a very simple formula for the determination of the direction of the current axis through the heart and body.

Except as regards one of the leads—the most important, however, as regards pathological valuation of the electrocardiograms—viz., the left lateral—the harmony of observation and of interpretation between Einthoven and myself has been complete. Obviously transverse is transverse, and right lateral is the equivalent of axial. And even the difference of view between us as regards the left lateral is more apparent than real. It depends on the fact that in 1887 I observed "broad" hearts, whereas in 1908 Einthoven observed "long" hearts, as will presently be explained.

It will have been evident from the foregoing description that the difference between us relates merely to the magnitude of the left as compared with the right lateral. I found it to be relatively small; Einthoven found it to be relatively large. A relatively small left lateral signifies a large angle; a relatively large left lateral signifies a small angle. If the left lateral is equal to the right lateral the angle is 0°—i.e., the current axis is vertical. If the left is larger than the right, as occurs with transposition of the viscera, the angle is to the right instead of to the left of the vertical, as indeed was shown in my first communications in the clearest possible manner.

My three cases of 1887 are happily still alive, and I have quite recently measured their angles with the following results: A. D. W. = 85°, A. M. W. = 51°, and Thomas Goswell = 45°. For Einthoven's two cases of 1908 I calculate the angles as being Fl. = 7°, El = 22°.

In 1887 I reckoned the left lateral as an "unfavourable" or "weak" lead. In 1908 Einthoven demurred to this and accounted for my supposed mistake by a supposition of his own into which I need not enter now. I have not altered my mind, or rather I have hardened it; I am again presenting the left lateral as a "weak" lead. I account for Einthoven's criticism by the fact that my first three cases were cases of "broad" heart, whereas Einthoven's two cases were cases of "long" heart.[3]

METHOD OF CALCULATION OF ANGLE.

And now it becomes necessary that I should explain how these angles have been calculated. Taking differences of electrical potential between a mesial point of the body—e.g., the mouth (or a foot) and its right and left sides—i.e., the two hands—we find that the differences on the two sides are unequal. In relation to the mouth, M, the potential difference between M and R is small, between M and L large. As we saw at the beginning of the hour the Right superior is a weak lead, the Left superior a strong lead. In analogy with the mechanical idea of a balance, M is the fulcrum or zero-point of a beam carrying a heavier weight at L than at R, and if we take the angle at M = 90°, then the inclination of the beam when the two arms are equally loaded will be given by the formula: $\tan \alpha = \frac{L-R}{L+R}$, where α is the angle formed with the vertical by a pointer fixed to the beam, R the weight (or the potential difference) on one side, and L the weight (or potential difference) on the other side.

The principle involved is illustrated by this rough model of a rectangular balance. With a weight of 2*d*. on one side and 1*d*. on the other the pointer is deflected through an angle α such that: $\tan \alpha = \frac{2-1}{2+1} = \frac{1}{3}$ $\therefore \alpha = 18°$.

With the weights 3*d*. on one side and 1*d*. on the other: $\tan \alpha = \frac{3-1}{3+1} = \frac{1}{2}$ $\therefore \alpha = 27°$.

Turning to the case of the electrocardiogram of the right and left superior leads, we have observed, e.g., a right superior spike = 0·0001 volt and a left superior spike = 0·0010 volt; the calculation is as follows:—

$$\tan \alpha = \frac{10-1}{10+1} = \frac{9}{11} = 0{\cdot}82 \quad \therefore \alpha = 39°.$$

From which we have concluded that in this particular case the current axis of the heart forms an angle of 39° with the vertical. Weighing the balance by 10*d*. on the left and 1*d*. on the right we see that the pointer indicates 39° on the scale. The balance is in fact an electrocardiac goniometer.

Similar considerations are applicable to the calculation of the angle formed by the current axis from the values of the left lateral and right lateral electrical effects (assuming, of course, that the two feet are iso-electric, and that the systolic spikes culminate synchronously on the two sides). But the angle at F must be taken as being more acute than the angle at M, and I have taken it such that $\cot \frac{1}{2} F = 2$ so as to obtain for the calculation of the inferior angle α the formula: $\tan \alpha = 2 \frac{R-L}{R+L}$. In order to secure this relation the angle at F has been taken = 53° and the angle between the two arms of the balance = 127°.

EXAMPLES.

For example, in the case of Thomas Goswell the right lateral spike = 0·0009 volt and the left lateral = 0·0003 volt, so that $\tan \alpha = 2 \frac{9-3}{9+3} = \frac{12}{12} = 1$ $\therefore \alpha = 45°$.

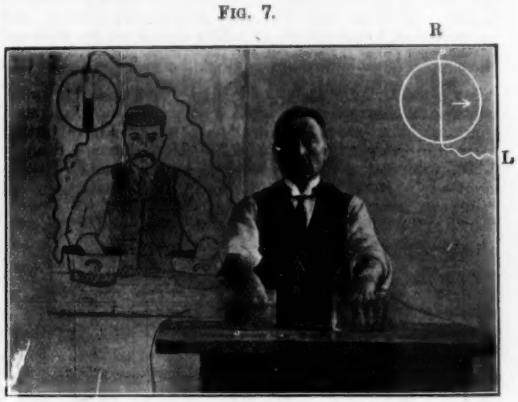
In Einthoven's case of Fl. I measure from the published records the axial spike as 18 mm. and the left lateral as 16, so that $\tan \alpha = 2 \frac{18-16}{18+16} = \frac{4}{34} = 0{\cdot}12$ $\therefore \alpha = 7°$.

And, again, in my case of A. D. W. α comes out = 84°, whereas in that of El. it is only 22°.

The plotting of these four angles—45° and 84° in my two cases, 7° and 22° in Einthoven's two cases—will serve to make clear what was meant by the remark made a few minutes ago to the effect that my first observations happened to have been made upon "broad" hearts, whereas Einthoven's subsequent observations happened to have been made on "long" hearts. Or instead of the expression "broad" and "long" I might have used the expressions "soft" and "hard." But that would have been to anticipate the considerations illustrated below by Fig. 9.

I am sure you will forgive me if, in connexion with this subject, I take the opportunity of referring to the case of Thomas Goswell in more detail, and of showing a photograph

FIG. 7.



Thomas Goswell sitting with his hands in water connected with the poles of a string galvanometer, in front of a diagram made in 1887 in which he is represented as connected with the poles of a capillary electrometer. In 1887 the angle α formed by the current axis with the vertical was guessed as being 45°. In 1913 the following are the values of the systolic spike in right and left leads. R sup., 0; L sup., 8; R lat., 9; L lat., 3; from which the angle α is calculated as being 45° above and below the heart.

that was taken the other day in the laboratory where I am at present working. Thomas Goswell was my laboratory man at St. Mary's Hospital 25 years ago, and frequently served as my normal subject for purposes of demonstration. He was the "model" from whom my lecture diagrams were made, and from whom the figures were drawn illustrating an "Introductory Address on the Electromotive Properties of the Human Heart," delivered at St. Mary's

[3] Einthoven: Pflüger's Archiv, vol. cxxii., pp. 551–2, 1908. The records of his two cases, "Fl." and "El.," are given on pp. 564–5.

Hospital Medical School at the opening of the session 1888–89.[4] In the figures of that time the current axis is represented at an angle of 45°, which was not quite an accidentally chosen value, although I certainly could not have justified the choice by any precise arithmetical calculation. But in Goswell's case "it felt like it," and I chose 45°. A few days ago, Thomas Goswell visited my present laboratory, and had his electrocardiograms taken by the five leads, and his ordinary photograph taken with the diagram of 1887 hanging up as a background. The photograph indicates sufficiently what, indeed, was proved by physical examination of the chest, that Goswell, now 54 years of age, has no heart lesion. The electrocardiogram values were found to be: right lateral = 9, left lateral = 3. The inferior angle calculated from these data is as follows:—

$$\text{Tan } \alpha = 2\,\frac{9-3}{9+3} = \frac{12}{12} = 1 \therefore \alpha = 45°.$$

I cannot find any memoranda of the values of Goswell's leads in 1887, but I remember very well that I estimated his right-hand value at one millivolt and that his left-hand value was much smaller—less than half, but more than a quarter—i.e., that the cardiac angle must have been over 34° and under 53°. The coincidence between the actual result and my recollections and the angle I had guessed at 25 years previously was at the least very remarkable.

The Case of the Eight Young Ladies.

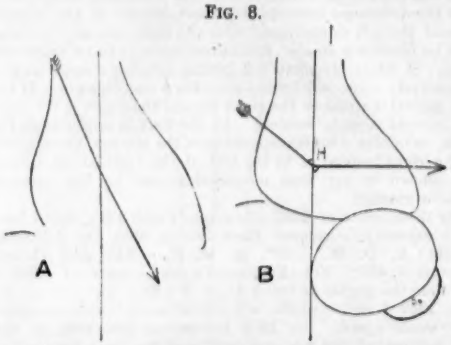
The next case that helped to open my eyes to the importance of paying special regard to the relative values of the right and left-hand spikes, and of calculating from these values the value in degrees of the inclination of the cardiac axis, was that of the eight young ladies. I say—perhaps a little disrespectfully—*the* case, because these eight cases formed one group, which I studied very closely, in fact, almost exclusively during a vacation fortnight undisturbed by the ordinary daily distractions of the laboratory.

During the previous session a young lady at the end of the lecture had asked to take electrocardiograms of herself, and had done so, not only on herself but on seven other young ladies. And I had taken away a memorandum of the right and left hand values in the case, or rather cases of these eight young ladies. The diversity of values was remarkable, and for a time disconcerting in a group of eight presumably healthy subjects, and I made various calculations and suppositions, in the course of which I was led to work out the simple formula for the angle $\tan \alpha = 2\,\frac{R-L}{R+L}$. And in doing this I was greatly helped by Dr. William Garnett, whose kind control and criticism as regards purely physical considerations were indeed invaluable to me. I have further to acknowledge the assistance of Miss Florence Stoney, M.D., who had the goodness to take skiagrams of these eight cases from which suppositions and inferences based upon the electrical signs were controlled and confirmed. Here are the data and the results summarised in tabular form.

No.	—	Right lateral.	Left lateral.	Tan α.	α.
1	M. G. B.	12	4	1	45°
2	M. J. H.	9	− 4	5·2	79°
3	N. L.	9	2	1·27	52°
4	P. W.	8	6	0·28	16°
5	H. S.	13	10	0·26	15°
6	M. N. A.	7	− 7	Inf.	90°
7	H. H.	9	4	0·78	38°
8	M. E. F.	9	3	1	45°

I cannot discuss this table in detail. I refer to it at present simply to illustrate the fact that the current axis varies normally within very wide limits, and that the variation can be due to causes other than age or gross cardiac lesion. It might no doubt be attributed to hypertrophy of the left side, or to dilatation of the right side, or to interruption or excitation of the right or of the left branch of the *a.-v.* bundle. But before we can discuss these possibilities we require to be familiar with what may be called physiological variations and with variations due to trivial causes. The heart muscle can be firm or flabby, hard or soft, long or broad within limits compatible with normal health. The organ as a whole can be displaced by a stomach full of gas, as, indeed, is shown by the skiagram of one of these eight young ladies. If we plot the angles of their current axes we notice that they form three groups that may be designated as vertical, horizontal, and intermediate, and we shall at once ask ourselves what can be the explanation of the contrasted types, vertical and horizontal. I hope to discuss this question more fully in the second lecture. For the present I am content to say that of several possible causes to which the difference can be due I am led to regard the tone of the heart muscle as a dominant factor. In my view of the matter a broad angle is the sign of a soft heart, and a narrow angle the sign of a hard heart, using these expressions in their literal physical sense. A soft or flabby heart, sessile upon the diaphragm; a hard or firm heart, standing upon the diaphragm—detached from its bed, as can be seen upon the fluorescent screen. A broad angle might be due to a flabby heart or to an atheromatous aorta or to a dilated stomach or perhaps to an hypertrophied left ventricle. A narrow angle may be due to a firm heart or perhaps to a dilated right side. And conceivably the heart may be pulled to one side or the other in consequence of a pleurisy or other cause of pulmonary retraction.

FIG. 8.



Outline sketches of the skiagrams of two of the eight young ladies to which have been added arrows to indicate the direction of the superior and inferior current axes, calculated from the observed values of the systolic spike in right hand and left hand leads. In A, the inferior current axis forms with the vertical an angle of 15°, and the muscular tissue is presumably firm. In B, the inferior current-axis forms with the vertical an angle of 90°—i.e., is horizontal; the circle below the heart is the outline of the shadow caused by an accumulation of gas in the cardiac end of the stomach; the muscular tissue in this case is presumably soft, as a consequence of imperfect digestion.

A reversed angle, large or small (I have witnessed both) can occur with complete transposition of the viscera. That, of course, is a rare and quite intelligible state of things, but what is much less rare and not nearly as intelligible is the fact that in certain cases, presumably of normal heart and also of manifestly diseased heart, we may find the relative magnitudes of the right and left leads such as to indicate that the cardiac current axis is inclined to the right instead of to the left. This is a memorandum of five such cases, three of which were presumably "normal."

		R.	L.	Value of α
A. G. W.	... Normal	16	18	..... −10°
Dr. A.	... ... ,, ...	15	16	..... − 4°
G. S.	... ... *a.-v.* Dissociation	20	24	..... −10°
F. F.	... ... Morbus ceruleus	10	8	..... −12°
Dr. G.	... ... Normal	12·5	15	..... −10°

This difference between broad and long, or soft and hard, does not seem to depend on sex or upon age, nor, I may add, upon coarse valvular disease. Cardiac muscle adequate to its mechanical task can be firm, with valves that are very imperfect. Failing cardiac muscle can be flabby, old cardiac muscle can be hard or soft, and with the normal or the premature atheroma of advancing years, inadequate cardiac muscle can be hard. Much further study of these matters is

[4] Brit. Med. Jour., Oct. 6th, 1888.

required; all that I am now urging is that the estimation of the electrical angle from right and left electrocardiograms forms an important element of information.

The Case of the Two Doctors.

The contrast just mentioned between broad heart and long heart, soft heart and hard heart, is particularly well-shown in the next case or pair of cases—that of the two doctors, Dr. D. and Dr. E. I have to thank Dr. J. S. Part, of the National Hospital for Diseases of the Heart, for the skiagrams that give value to this case. Indeed, the skiagrams, together with a memorandum of the electrical data, are all that are required to make the significance of

FIG. 9.

A. Case of Dr. E.; cor breve et molle.

B. Case of Dr. D.; cor longum et durum.

the contrast evident. That is not to say, however, that there is nothing to be discussed in this connexion. There is, but I must pass on.

SOME PATHOLOGICAL CONDITIONS.

I had intended in this first lecture to deal only with the physiological side of the electrocardiogram, reserving for the second lecture pathological considerations and cases. But in this matter, as in many others, it has proved impossible to talk pure physiology without trespassing upon the abnormal, and it will, I am sure, be equally impossible to discuss cases of diseased heart without constant reference to the physiological foundations of our knowledge.

Thus the grouped syndrome, familiar to us all under the designation of Adams-Stokes disease, is to a physiologist, considering the state of the heart, still more familiar as a common experiment of the laboratory. Auriculo-ventricular dissociation commonly occurs in the moribund heart. It was first pointed out in the diseased human heart—not by either Adams[5] in 1827 or by Stokes[6] in 1846, although both

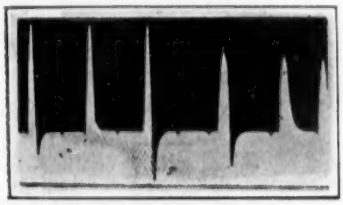
FIG. 10.

Auriculo-ventricular dissociation. The case of J. B. Damiron. Chauveau, Archiv de Médecine, 1885, p. 161.

of these most acute clinicians clearly recognised the syndrome—slow pulse plus *petit mal*, but by Chauveau in 1884, who described it perfectly and with perfect comprehension of its essential novelty and significance. Indeed, the case of Jean-Baptiste Damiron, as described by Chauveau[7] in 1885 under the title "Dissociation du Rythme Auriculaire et du Rythme Ventriculaire," is in my estimation a model description of a conclusive clinical inquiry.[8] I wish time allowed of the quotation of passages, but as it is we must be satisfied to glance at a reproduction of one of the figures (Fig. 10). You will see at once that it represents precisely what is now so familiar in the electrocardiograms of *a.v.* dissociation or heart-block.

Pulsus bigeminus, pulsus alternans, delirium cordis or muscular fibrillation, asystole of the left auricle, regular and

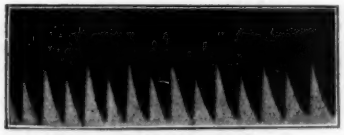
FIG. 11.



Variations accompanying spontaneous beats of puppy's heart. The variations of the auricle are visible as small black teeth on the tracing, and it may further be seen that the variations of the ventricle are in two instances monophasic, indicating negativity of apex, and in three instances diphasic, with first phase = apex negative to base, second phase = base negative to apex.

irregular irregularities, may also be mentioned as common phenomena of the laboratory that have only in quite recent times acquired clinical value and significance by the labours of Wenkebach, Mackenzie, George Gibson, Thomas Lewis, the younger Hering, and many others, following in the main the indications of Einthoven, who was the first to

FIG. 12.



Electrocardiogram of a moribund cat's heart exhibiting true "pulsus alternans."

apply his own instrument, the string galvanometer, to the clinical study of cardiac irregularities. Indeed, in this respect the moribund heart in the laboratory has often afforded an epitome, so to say, of phenomena that unfold themselves clinically in the course of months and years. Gaskell's clamp and the immediate production of heart-block, partial or complete, are, of course, familiar to us all in connexion with the various clinical forms of heart-block. Here

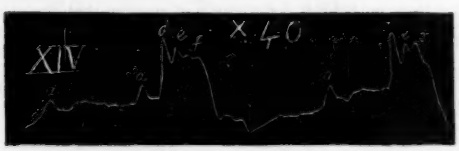
[5] Adams: Cases of Diseases of the Heart, accompanied with Pathological Observations, Dublin Hospital Reports, pp. 353-453, 1827.

[6] Stokes: On Slow Pulse, Dublin Quarterly Journal of Medical Science, vol. ii., p. 73, 1846; The Diseases of the Heart and the Aorta, Dublin, 1854, p. 305, et passim.

[7] Chauveau: De la Dissociation du Rythme Auriculaire et du Rythme Ventriculaire, Revue de Médecine, vol. v., p. 161, 1885.

[8] Dr. James Mackenzie has called my attention to a previous record by Mahomed in the Guy's Hospital Reports for 1875 (vol. xx., p. 261). The record is excellent and conclusive, but the description, while correct, is rather tentative than conclusive. The document is buried among several other cardiographic curiosities in correspondence with

FIG. 13.



Galabin's paper, Fig. 14. Guy's Hospital Reports, 1875, p. 261.

the title of the communication—"On the Interpretation of Cardiographic Tracings and the Evidence which they afford as to the Causation of Murmurs attendant upon Mitral Stenosis." But the figure itself is an obvious proof that the fact was actually observed. It is reproduced here with the addition of an approximate time-record. (Fig. 13.)

is another and perhaps less familiar example of the sort of rapid representation of clinical features that may sometimes be witnessed on the moribund heart. It is taken from a paper by Waller and Reid,[9] and shows the rapid development of true pulsus alternans ending with ventricular fibrillation in the case of the excised and therefore moribund heart of a cat.

Here is another figure (Fig. 11) taken from the same paper showing the electrical indications of *a.-v.* dissociation, and another (Fig. 12) showing the electrical indications of true alternation of the ventricular beat. But the hour has struck and I must reserve any further consideration of *a.-v.* dissociation for the next lecture.

ALIMENTARY TOXÆMIA:

A SUMMARY AND REPLY.[1]

BY W. HALE WHITE, M.D. LOND., F.R.C.P. LOND.,
SENIOR PHYSICIAN TO GUY'S HOSPITAL.

IT is obviously impossible to present in a quarter of an hour any adequate summary of a debate in which 60 speakers have taken part, but the speeches of the pathologists, chemists, and bacteriologists have probably interested the society most, for in an inquiry as to what clinical symptoms can with justice be attributed to alimentary toxæmia the first thing is to understand how the poisons are formed and how it is that they affect the body. There has been much said to show that it is not the formation of poisons which chiefly matters. Probably they are continually being formed from the contents of the alimentary canal, or they might even occur as endotoxins derived from dead bacteria, but no harm follows so long as the constantly active defences of the body against such poisons are in full play. But the liver may fail us, the thyroid may fail us, mechanisms in the intestinal wall may fail us, or other unknown defences may fail, and then poisoning symptoms will occur. It will be a great step forward when, with the help of experimental pathologists, we are able to say which cases of supposed alimentary toxæmia are really caused by disease of the liver, disease of thyroid, or disease of some other organ, as the case may be, or which are due to the formation of abnormal poisons or to an excess of normal poisons in the alimentary canal. Then sometimes it may be that the symptoms ascribed to alimentary toxæmia are really due not to the formation of more poison but to the fact that the wall of the bowel being diseased the poison is absorbed more readily than in health, or, again, some alteration in the intestinal contents may render rapid solution and consequent absorption of the poison easy.

Considering next the bacteria in the intestine, it is necessary to point out that if a person is poisoned by absorption from the intestine it does not follow that the poison is produced by bacteria; it may be that it is one of the normal results of the splitting of proteins, but that in all healthy subjects the poison is destroyed by the liver, which, however, is not performing this normal function in the person suffering from poisoning. We only know for certain that definite micro-organisms lead to poisoning when specific micro-organisms introduced from without cause specific diseases—e.g., in the case of typhoid, dysentery, cholera, and Gaertner poisoning; but many of those who have taken part in this discussion strongly suspect that under certain circumstances the micro-organisms constantly present in the alimentary canal lead to poisoning. But there is, I think, a consensus of opinion that the phrase "alimentary toxæmia" should be limited to the absorption of chemical poisons produced in the alimentary tract, and should not include the passage into the blood of bacteria themselves, although this probably occurs more often than is usually thought.

Which micro-organisms originate symptoms that are commonly included under the term alimentary toxæmia we do not know, even in comparatively simple cases. For example, we do not know the micro-organism which is the cause of enterogenous cyanosis; nor do we know whether, if the symptoms are not due to failure of protection against poisons, they are due to excessive number of bacteria, unusual supply of material for their growth, or absence of bacteria which are antagonistic to them; nor do we know whether the bacteria form the poisons from their medium, from their intrinsic metabolism, or from endotoxins liberated at their death. Although it has clearly appeared that we have a considerable knowledge of the bacterial flora of the human alimentary canal, it must be confessed that this discussion has shed very little light on the bacteriology of alimentary toxæmia originating in the gastro-intestinal tract, but we know more about that of pyorrhœa alveolaris, although even here we often only surmise which is the offending organism by the rather unsatisfactory method of the opsonic index. Probably among the intestinal bacteria the bacillus aminophilus intestinalis and its allies will most repay for the research, for much work has been done on them, but it certainly apppears that much of the statements of the French school on the intestinal flora need serious revision.

As the subject of this debate has been alimentary toxæmia it was to be hoped that from it we should learn something definite as to the toxins concerned. Unfortunately we have not. It is well known that the view of the Metchnikoff school is that poisons are manufactured in the intestine, especially the large, by micro-organisms, and these poisons produce the symptoms commonly comprehended in the term alimentary toxæmia, and that indol is one of the most important of these poisons, but although that view has been upheld by some speakers it has been severely criticised. More than one authority on bacteriology thinks it gratuitous to regard indol as the main toxic product of putrefactive organisms, and tells us that the conclusion drawn by Distaso that the flora of constipation is an index of intoxication is entirely unsupported by the evidence he adduces. I must confess it seems to me that the case for indol has not been proved, and that there are serious defects in the work of the French school on the bacteriological and biochemical properties of the intestinal flora. If the debate has done no other good it has helped to make widely known that much of the bacteriological and biochemical work which has been done upon the flora of the large intestine and the poisons found there does not satisfy the standards of scientific accuracy. But there is a general impression that the poisons of alimentary toxæmia may in many instances be comparatively simple chemical bodies derived from the proteins of the food. It is known that the ammonia present in the portal vein is derived from putrefaction in the large intestine. Tyrosine and histidine may be converted into poisonous substances by putrefactive bacteria, and experiments have been quoted which suggest that when certain of these poisons are absorbed arteriosclerotic changes in the vessels and disease of the kidney may follow. Confirmation of these experiments will be looked forward to with great interest. Of the poisons formed in the alimentary canal probably the study of derivatives, of tyrosine, leucine, and histidine will most repay further investigation.

In the clinical part of the discussion the dental surgeons who contributed to it seemed to be on surer ground than other speakers. Disease of the gums leading to periodontal disease is by far the most fruitful source of oral sepsis. Large numbers of people owe ill health to it, and it is often overlooked, and especially we are inclined to forget that mouth-breathing in children leads to persistent marginal gingivitis, and that this disease is more intractable and serious in its results in those who are mouth-breathers, from which it follows that not only must the teeth be treated but often it will be necessary to treat nasal obstruction also. Different speakers have laid a varying amount of stress on the use of autogenous vaccines. Probably the most important part of the treatment is local, and here much judgment is required. Some remove teeth needlessly, some do not remove enough of them, but in the more severe examples the intelligent use of autogenous vaccines may be of distinct help. The question has been raised as to whether in a few cases pyorrhœa alveolaris is not secondary to a toxæmia arising from some parts of the alimentary tract. It is quite possible that this may be so, or, at any rate, that such local pyorrhœa is increased by the fact that the general resistance of the body is lowered by an alimentary toxæmia of other origin, but obviously the question can only be settled by a discussion of each case in

[9] Philosophical Transactions, 1885. The examples referred to in the text are Tracings 1, 2, 3, and 4 of that paper, not here reproduced.

[1] A paper read at a special meeting of Fellows of the Royal Society of Medicine on May 7th, 1913, at the close of a debate on Alimentary Toxæmia.

which it may be raised, and such suggestions may do harm if they lead to a widespread belief that the local treatment of the disease of the gums is unimportant. Mention has been made of the many ways in which it is conceivably possible that pyorrhœa alveolaris might affect the general health, and it is clear that the opinion of most speakers is that nearly always it is by direct absorption from the diseased gums. Further, it must not be forgotten that the tonsils may be the source of chronic toxæmia.

It appears that in this country not much attention has been paid to the relationship between alimentary toxæmia and diseases of the eye, but this discussion has been of great use in directing attention to the question. Certainly some diseases of the eye may be due to pyorrhœa alveolaris. What others are due to other forms of alimentary toxæmia can only be decided by future clinical observation which avoids the error of ascribing changes to alimentary toxæmia because no other cause can be found, but the extremely interesting question as to whether failure of accommodative power may not often be due to intestinal toxæmia needs further investigation. If the remarkable figures quoted by one speaker are confirmed a great advance in our knowledge will have taken place.

It is generally allowed that the mere absorption of a poison introduced from without—e.g., morphine—from the alimentary canal is not enough to constitute alimentary toxæmia, and the striking urticaria which follows the ingestion of shellfish, copaiba, &c., in some persons is most likely an example of anaphylactic phenomena following the absorption of foreign proteins, and therefore not an instance of alimentary toxæmia. The purpura often associated with cirrhosis of the liver is probably an alimentary toxæmia in which the poison absorbed from the intestine is able to act because the protective influence of the liver is, owing to its disease, in abeyance. Henoch's purpura may be an example of alimentary toxæmia, but we really know nothing of its pathology. The dark-blue tint of the skin in enterogenous cyanosis is almost certainly due to alimentary toxæmia, and so may be the brown cutaneous pigment so often seen in those who have disease of the intestines. It seems as though increase of knowledge will show that several abnormalities of the skin may be ascribed to toxins formed in the alimentary canal.

We now pass to the most controversial part of the subject. It has been urged by several speakers that in consequence of the erect posture of man the intestines tend to drop; that to overcome this peritoneal bands are evolved; that they produce kinks; that these lead to stagnation of the intestinal contents; this leads to increased putrefaction; this to the formation of poisons, and that these, passing into the general circulation, cause definite symptoms and predispose to many diseases. Observers are by no means agreed as to the frequency with which these bands are found, nor, it is said, are they evolved as a result of the erect posture of an individual, because they may be found in the human fœtus, and are in reality mere expressions of a normal and healthy fœtal process. The question will, it seems to me, have to be solved by anatomists. Are these bands to be found in all animals in whom the body is usually vertical—e.g., apes, gibbons, and penguins? Are there evidences of them in animals whose bodies approach the vertical—e.g., giraffes? Are there what might be called reverse bands in bats that spend so much of their time head downwards? Here I might anticipate and point out that if these bands are present in all animals that adopt the erect attitude it would be of great interest to know whether such animals have intestinal stasis.

Passing to the question of kinks, it seems from listening to this debate that those who have laid great stress on an ileal kink as a cause of intestinal stasis have not estimated at its full value the strength and activity of the ileocæcal sphincter, and that much of the supposed holding back of the intestinal contents at the end of the ileum is normal, and that when abnormal it is often due to spasm of the ileocæcal muscle.

Many of the statements about kinks and stasis claim support from X ray examinations after bismuth or barium sulphate, but we have been told that sometimes food is given too soon after a bismuth meal when we wish to know if there is gastric stasis; that sometimes so much bismuth is given that its weight may invalidate our observations; that allowance is not made for normal variations in the average time taken in the passage of a bismuth meal, anything differing from the average being taken as abnormal; that sometimes the bismuth mixture lags in the stomach because it is nasty, although in the same patient it will leave the stomach normally if it is palatable; that the so-called writhing of the duodenum is nothing else than the normal peristalsis and segmentation rendered more clearly visible than usual by the great quantity of bismuth-containing chyme present; that the X rays do not show the duodenum to be dilated in cases of duodenal ulcer; and that many of the kinks which the X rays are supposed to show depend upon the fact that the X ray picture is taken in a single plane. It is clear that as the X ray work on this subject has been so severely criticised it will have to be repeated by independent observers before we can decide upon its value.

Those who believe that evolutionary peritoneal bands often lead to intestinal stasis because they produce kinks, especially a kink at the last part of the ileum, think that as a further result a kink forms at the end of the duodenum; this and the stomach dilate, and either may become ulcerated. This debate has not provided any statistical evidence to show in what proportion of sufferers from duodenal or gastric ulcers such kinks are found, nor has any experimental evidence been brought forward to show that in animals such ulcers form as a result of an artificially induced ileal kink; and we have heard one speaker say that intestinal stasis never leads to gastric stasis, nor to duodenal kinking, dilatation, or ulceration, and that duodenal ulcers are associated with an unusually rapid passage of chyme out of the stomach and through the whole of the small intestine. It seems that the onus of proving their contention lies with those who believe that the above-mentioned phenomena follow intestinal stasis.

I do not think that in a short summary such as this anything can with advantage be said about the more remote effects—e.g., tubercle, cancer, rheumatoid arthritis, arterio-sclerosis, disease of the heart and kidney—which have been ascribed to intestinal stasis, for up to the present no statistical or experimental evidence has been brought forward for such a view. It may turn out to be correct. I hope it will, for I should like to see such an extremely brilliant suggestion shown to be true; but up to the present no adequate evidence has been brought forward for this supposition, which, if it is to be accepted, must have in its favour not one or two isolated cases, or a mere expression of opinion, but a large mass of incontrovertible experiments and statistics adduced by more than one observer. But whether or not future observation proves its truth there is no doubt that we owe a debt to the author of it, for if it is correct it marks a new era in medical thought, and even if the evidence for it fails it has made us think hard.

Nor do I think that time allows me to say much about treatment. We have seen that the ways by which intestinal poisons may be formed are so various, and the faults of our mechanism which may allow them to get into our bodies are so numerous, that proper treatment is in our present ignorance often impossible—indeed, almost our only treatment, surgical or medical, is the very primitive plan of keeping the bowels well cleared out. Sometimes, indeed, nature does that for us, for, as has been pointed out, severe alimentary toxæmia may exist with a diarrhœa which keeps the intestines almost empty. On the other hand, many people whose bowels are rarely open have not alimentary toxæmia. It is agreed that in the vast majority of cases medical treatment suffices; and what has been said about treatment in this discussion has come chiefly from the surgeons. Removing the colon has been mentioned, but a surgeon of wide experience tells us he has never seen a case in which he considered it justifiable. Short-circuiting the ileum into the sigmoid, too, has been discussed. Some say it succeeds, but it is clear it often fails to cure, and some surgeons prefer the simpler operation of appendicostomy. But if the cases that now seem to some to justify surgical treatment had been treated in the first stages by proper medical means surgical interference would not be necessary, so that, when this is widely appreciated, cases ought never to become so ill that surgical treatment will be contemplated, and we may hope that one result of this discussion will be that we shall keep "the drainage scheme" of our patients in sufficiently good order as to render surgical interference unnecessary.

Wimpole-street, W.

GROWTHS IN THE GALL-BLADDER AND GROWTHS IN THE BILE-DUCTS.

BY SIDNEY PHILLIPS, M.D. LOND., F.R.C.P. LOND.,
SENIOR PHYSICIAN TO ST. MARY'S HOSPITAL; PHYSICIAN TO LOCK HOSPITAL.

THE two series of cases which follow, all submitted to operative or post-mortem examination, the one of cases of growth in the gall-bladder, the other of cases of growth in the common bile-duct, with or without growth in the gall-bladder, exemplify the symptoms in the two conditions.

Cases of Growth in the Gall-bladder.

CASE 1.—The patient, a married woman, enjoyed good health until October, 1908, when she had an acute attack of pain in the liver region. This recurred on June 11th, 1910, when it was so severe as to "double her up" for an hour. The pain recurred each night, but left her in the day, and she did not give up work till July 9th. From this time she remained in bed under medical advice until July 19th, when she was admitted into St. Mary's Hospital. She was fairly nourished. A tumour could be felt, apparently the enlarged gall-bladder, and behind it another mass which was very tender. There was no vomiting or jaundice at any time.

On the next day at my request Mr. S. Maynard Smith opened the abdomen. The gall-bladder was found wrapped round by omentum, to which and to the liver it was firmly adherent. The gall-bladder contained several calculi and breaking-down soft growth. This growth had become glued on to the under surface of the liver and invaded it, forming a mass on the liver of the size of a plum. The gall-bladder and this invaded part of the liver were removed in one mass. The patient got over the operation very well and went home in three weeks.

CASE 2.—The patient, a woman aged 70, began to experience pain in the abdomen about June, 1905; it passed off, but a "bearing-down" pain came on in April, 1906, and recurred from time to time. In June she got a very severe attack with frequency of micturition of very scanty dark-coloured urine. Another attack came on in July, and she then noticed a lump and was admitted into St. Mary's Hospital on July 7th. There was no jaundice or any symptom except a tumour of the size of a kidney in the right flank, moving with respiration and with resonance behind it. On July 25th Mr. A. J. Pepper opened the abdomen, exposing a malignant encapsuled mass fixed above to the liver; there were cysts and two small calculi in its interior. Death occurred on Sept. 9th, when the growth was found to be an endothelioma of the gall-bladder.

CASE 3.—The patient, a woman aged 52, was seized with violent pain in the right hypochondrium on May 20th, 1909. She remained in bed, and the attacks of pain came on every three or four days for half an hour or so. On June 3rd she vomited. On the 7th she came into St. Mary's Hospital. Temperature 99·6° F. There was a large solid feeling tumour in the right flank with resonance behind it; there was no jaundice or other symptom of any sort. Mr. Pepper a week later opened the abdomen, exposing a huge mass fixed to the under surface of the liver, which was evidently the gall bladder. It was not thought advisable to attempt further operative procedure.

CASE 4.—The patient, a married woman aged 48, about 1894 had jaundice and acute pain in the liver region; in 1905 an attack of pain and shivering; in March, 1907, pain in the epigastrium and back independent of food—no nausea or vomiting. She was sent to me by Dr. A. B. Rendel in June, 1907. The liver could be felt enlarged and the gall-bladder was tense and enlarged; no jaundice, but the patient was much wasted. Operation by Mr. C. B. Lockwood showed a growth of the gall-bladder, which was opened. A few days later a calculus passed out of the opening in the gall-bladder. She died a little later.

CASE 5.—The patient, a man aged 54, had slight pain in his right side in January, 1907, and in October some acute pain, chiefly in the right hip. After resting in bed he came into St. Mary's Hospital on Nov. 1st. The liver appeared to be of enormous size, not tender, and quite smooth except for some nodules in the left lobe. The enlarged mass pulsated strongly. He did not seem ill, was well nourished, free from jaundice, ascites, or albuminuria; he ate full diet and made no complaint of discomfort of any sort. But he wasted, and his feet became a little œdematous. He died in December, and at the necropsy the whole right lobe of the liver appeared to be replaced by a homogeneous, yellowish looking, very solid growth. It was not till a section was made through it that three or four small calculi were found in its interior, and it was shown to be a tumour of the gall-bladder; the compressed right lobe of the liver was found above the growth. There were some small nodules of growth in the left lobe of the liver, and quite recent small nodules in the peritoneum.

Cases of Growth in Bile-ducts, with or without Growth in the Gall-bladder.

CASE 6.—The patient, a married woman aged 62, after suffering from intermittent attacks of abdominal pain without any vomiting, became jaundiced early in December, 1910; this gradually deepened, and she came into St. Mary's Hospital on Jan. 28th, 1910, intensely jaundiced, with absence of bile from the stools. An indefinite mass was felt in the region of the gall-bladder, over which the muscles were very tense. She was very weak and emaciated and died five days later.

The necropsy showed the gall-bladder to be closely adherent to the under surface of the liver; it contained seven or eight gall-stones and a mass of soft growth. The common duct was also full of growth obstructing its lumen. There were one or two nodules of carcinoma in the liver and a very small one in the pancreas.

CASE 7.—The patient, a married woman aged 52, was well until October, 1904, when she felt weak and ill, and jaundice came on with colourless stools. She had no indigestion or vomiting, or pain, or other symptom. She came into St. Mary's Hospital on Dec. 9th, 1904, very deeply jaundiced, with putty-like stools and much bile pigment in the urine. The outline of the gall-bladder was not detectable through the very fat abdominal wall. There was œdema of the legs, and her temperature was constantly 99° F. She was in a drowsy condition from toxæmia. On Dec. 13th Mr. Pepper opened the gall-bladder and removed from it a stone of considerable size. She died on the 16th.

At the post-mortem examination the liver weighed 4 lb. On section its ducts were found greatly dilated and contained pus. There was no growth in the gall-bladder, but the hepatic duct was thickened at its junction with the cystic duct, and microscopic section showed primary carcinoma of the hepatic duct. There were two small secondary growths in the right lobe of the liver.

CASE 8.—The patient, housewife aged 53, became gradually jaundiced in September, 1904. Two months later the motions got pale. About Christmas-time she got sudden attacks of pain similar to those she had had five years before which her medical adviser attributed to biliary colic. She came into St. Mary's Hospital on Feb. 6th, 1905, fairly nourished, moderately jaundiced, with colourless stools. The liver was a little enlarged and the gall-bladder could be distinctly felt as well as another swelling near to it. Operation by Mr. Pepper showed matting together of the tissues around the neck of the gall-bladder, bile-ducts, and duodenum. These adhesions were broken down and a nodule could be felt in the common bile-duct, which was incised and a large calculus was found within it. The duct itself was blocked up by growth, and there were also growth and a calculus in the gall-bladder. The patient died five days later.

Post mortem the gall-bladder was found to be of the size of a hen's egg full of a soft mass of blood-stained growth extending into the cystic duct and for a short distance into the hepatic duct. There was a growth near the ampulla in the common duct and also half an inch higher up.

CASE 9.—The patient, a male aged 78, after suffering from what he thought to be lumbago for three months, became gradually jaundiced about January, 1910; there was no pain or vomiting. He came into hospital on Jan. 19th deeply jaundiced, with colourless stools and some pain about the umbilicus. There was a hard mass below the liver, but the abdominal wall being very thick it was not determinable whether it moved with respiration. There were some pyrexia and rigors on the first and sixth days after admission. Purpuric patches came out, and he died on Feb. 24th.

Post mortem the gall-bladder was full of calculi and firmly adherent to the liver. It contained a little pus and its wall was the seat of endothelial sarcoma, and there was similar growth in the common bile-duct; also a small nodule of growth in the body of the pancreas.

CASE 10.—The patient, a male aged 45, in April, 1910, had a typical attack of biliary colic with dark discolouration of the urine and jaundice which gradually deepened. He was admitted into St. Mary's Hospital on Sept. 5th, 1910, with deep jaundice and colourless stools. The gall-bladder could not be felt at the time, but was felt enlarged a little later. On Oct. 16th laparotomy showed it to be but little distended, and it contained no growth, but the common bile-duct was dilated and contained several small calculi, and its lumen was obliterated by growth. He died soon afterwards at home.

Remarks.—Gall-stones were found in the four cases of growth in the gall-bladder in which they were searched for; they were also found in all the cases of growth in the ducts, though it has been commented upon as remarkable that, while calculi are found in 95 per cent. of cases of gall-bladder growth, the association is exceptional with growths in the duct. But, as Mayo Robson points out, when not present, they may have been passed, and Rolleston found gall-stones in 18 out of 36 cases.

Though the association of gall-stones with growth in the gall-bladder is generally admitted, authorities differ as to which is the primary affection. In a paper read before the Pathological Section of the Royal Society of Medicine in January, 1911, Dr. J. P. Candler adduced post-mortem records from Claybury Asylum tending to show that the frequency of association between gall-stones and growth in the gall-bladder had been over-estimated. The removal of calculi by operation will render valueless future statistics as to the probabilities of gall-stones being followed by growth, but the rarity of growth in the gall-bladder without gall-stones, and the frequency of gall-stones without growth, together with the long period by which symptoms of cholelithiasis often precede the period at which growth occurs (in a case of Jourdain's 25 years, and in one of the present cases 12 years) tend to the conclusion that calculi are a potent determining cause of growth in the gall-bladder, and Naunyn, indeed, writes that they are almost the sole cause.[1]

Symptoms.—Gall-bladder growth may give but few symptoms, and a good example of its latency was the subject of a lecture by Lancereaux.[2] Dyspepsia and loss of flesh are described as occurring, but were absent in my cases, and Lancereaux points out that the affection occurs mostly in elderly obese females who may remain quite fat throughout. Even when dyspepsia and loss of flesh occur they are of little use in the diagnosis of an individual affection of the digestive apparatus.

In many of the recorded cases there was a history of pain beginning long before growth could have been present and of the character produced by cholelithiasis. It has been

[1] Cholelithiasis, Sydenham Society's Translation, p. 165.
[2] Semaine Médicale, 1887, pp. 290–330.

noticed that when growth succeeds on calculi the symptoms of the latter often pass into abeyance, and there need be no pain with growth of the gall-bladder. As there are calculi in all these cases no inference of associated growth can be drawn from pain over the gall-bladder, even when pain is present, unless it is very severe and continuous and accompanied by much local tenderness.

Jaundice has been said to occur in one-third of the cases of growth in the gall-bladder. Probably this estimate is much too high. In the collated cases which are cited, as Musser's,[3] of 69 per cent., and Meunier's[4] of jaundice in 26 out of 30 cases, no distinction was made between cases of growth in the gall-bladder and of growth in the ducts. Rolleston[5] points out that malignant disease limited to the gall-bladder, where there is no pressure on the common or hepatic duct, does not produce jaundice. There is no anatomical or physiological reason why a tumour of the gall-bladder should produce jaundice. There was none in any of the cases here recorded, and so far from jaundice being an evidence of growth in the gall-bladder it is rather evidence that if there is such growth there is something in addition which will greatly lessen the possibilities of successful operation.

The only evidence to be expected of growth in the gall-bladder is the presence of a tumour, often with a history of long-standing cholelithiasis. And there may be no tumour detectable in cases of soft growth projecting into the interior of the viscus. On the other hand, where the growth grows eccentrically the tumour may be enormous. Adhesions of the tumour to surrounding parts, interfering with its mobility with respiration, may render its identification as a gall-bladder tumour very difficult, and it may be quite impossible where the tumour invades and occupies the usual position of the liver, as in Case 5, where even post mortem its nature was only ascertained when on section gall-stones were found in its interior.

The cases of growth in the bile-ducts contrast with those of the gall-bladder by the constant presence of jaundice without tumour; although, as Mayo Robson points out, catarrhal jaundice may occur in the course of growths of the gall-bladder, it is not the same early prominent symptom that it is in cases of gall-bladder growth which also give rise to tumour, and the difficulty of the diagnosis of growths in the bile-ducts is to distinguish them from growths in the pancreas rather than from growths of the gall-bladder.

The occurrence of jaundice without tumour is an important indication that the disease is not growth in the gall-bladder; and when with tumour of the gall-bladder there is jaundice the growth is probably not limited to the gall-bladder. A tumour of the gall-bladder with no jaundice gives hope that relief or cure may result from operation. And the frequency with which calculi are found with growths both of the gall-bladder and ducts is a strong reason for removal of gall-stones by operation at the earliest possible moment.

Upper Brook-street, W.

[3] Boston Medical and Surgical Journal, 1889.
[4] Bulletin Société de Anatomie, Paris, 1893, p. 585.
[5] Diseases of the Liver, p. 631.

ROYAL INSTITUTION.—Professor Bateson's postponed lectures on "The Heredity of Sex and Some Cognate Problems" will be delivered at the Royal Institution on Monday, June 2nd, and Wednesday, June 4th, at 3 o'clock.

THE HANBURY MEDAL.—The Hanbury gold medal, which is awarded biennially for high excellence in the prosecution or promotion of original research in the chemistry and natural history of drugs, has this year been adjudicated to Mr. F. B. Power, Ph.D., LL.D. Dr. Power has been for many years director of the Wellcome Research Laboratories, and is the author of many scientific memoirs recording the results of his researches. Before coming to London he had held positions in the Universities of Strasburg and Wisconsin. At the former he was assistant to the late Professor Flückiger, and at the latter he occupied the chair of pharmaceutical chemistry and pharmacognosy for nine years. He was also for some years assistant to the late Professor Maisch at Philadelphia College of Pharmacy. The trustees of the Hanbury Memorial Fund are the Pharmaceutical Society.

THE DANGERS AND COMPLICATIONS OF SALVARSAN TREATMENT.

BY HUGH WANSEY BAYLY, M.A., M.R.C.S. ENG., L.R.C.P. LOND.,

PATHOLOGIST TO THE LONDON LOCK HOSPITAL; CLINICAL PATHOLOGIST TO THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC; ASSISTANT IN THE BACTERIOLOGICAL DEPARTMENT, ST. GEORGE'S HOSPITAL.

THAT the routine treatment of syphilis by intravenous injections of salvarsan involves an unjustifiable risk to life has been, and still seems to be, insisted upon by a few authorities, including Major H. C. French, R.A.M.C., Mr. C. F. Marshall, and Mr. J. Ernest Lane, of this country, and M. Gaucher, of France. As probably over a million injections have now been given, and only about 150 deaths have been recorded in the literature, and as Major T. W. Gibbard, R.A.M.C., and Major W. S. Harrison, R.A.M.C., with a record of over 2000 cases, have recorded no death, and as only two deaths have been recorded in the very large number treated in the London Lock Hospitals, and as I have had no deaths among 500 cases treated personally, I think we are justified in concluding that the risk to life is extremely small; but, at the same time, it is useless to deny that there has been, and probably still is, a very slight risk to life.

Deaths.

Deaths group themselves under four headings: (1) Those with symptoms of meningitis; (2) those with symptoms of nephritis and uræmia; (3) those with toxic symptoms associated with degenerative processes occurring in the liver; and (4) those with symptoms of pulmonary embolism. In the majority of the few fatal cases recorded the symptoms commence only after the administration of the second or subsequent dose of salvarsan.

Among the list of fatal results M. Gauchier has reported a case of leptomeningitis following salvarsan. Three days after injection the patient had a slight headache, and on the fourth day became unconscious with convulsive movements, elevated temperature, cyanosis, rapid pulse and respiration; the pupils were first dilated, then contracted, and the temperature rose to 105° F. shortly before death.

Mr. W. Campbell M'Donnell has reported a case in which the first injection was followed by no fever or ill-effects, but 48 hours after the second injection there were fever and aching of the legs. The next morning the patient was dazed, delirious, and dribbling from the mouth; later in the day a punctate, red rash appeared on the body, and in the evening an epileptiform fit occurred. The following day the fits recurred at short intervals, until the patient ultimately died after 20 hours of unconsciousness.

In a case reported by Dr. H. O. Ruh the patient complained of severe abdominal pains soon after injection, and in a few hours the temperature rose to 101·2° and the pulse to 120; there was almost complete suppression of urine, and the patient became apathetic and gradually passed into coma, which terminated in death. At the necropsy the kidneys showed evidence of nephritis, and the liver was enlarged, soft, and yellow; and on microscopical examination the lobules were found to be irregular in size and shape, ragged, and indistinct, and showed fatty granules, many containing bright yellow pigment. Both acute nephritis and fatty changes in the liver cells have been produced by experimental arsenic poisoning, and one appears justified in presuming that salvarsan and arsenic produce similar effects on the liver and kidney when given in toxic doses.

One case of death in a healthy woman occurred in the Lock Hospital, in which the symptoms did not appear until three days after the administration of the second dose, and the post-mortem examination showed a condition characteristic of toxæmia, and degenerative changes were found in the liver.

I am in entire agreement with Major Gibbard and Major Harrison that some patients appear to be exceptionally susceptible to salvarsan, and that probably the deaths occurring under the first three headings mentioned above are generally the result of a cumulative action of the drug taking place, the second injection being administered before

the elimination of the drug given at the first injection has been completed.

The deaths occurring from pulmonary embolism are caused by the shifting of a clot from a vein in which phlebitis and thrombosis have occurred above the point of injection.

Complications.

Short of death, complications most likely to cause grave anxiety are those produced by the toxic action of the drug on the body in general (and particularly on the meninges and kidneys) and by phlebitis and thrombosis in the vein which has received the injection. Of 500 cases which I have treated personally I have met with five that have caused me anxiety. The most serious of all I will give first.

The patient was a healthy young man with primary syphilis, and was sent to me by Dr. T. Drysdale for treatment with salvarsan. I gave him 0·6 grm. of salvarsan intravenously, and 48 hours afterwards a second dose of the same quantity. The patient bore the injections well, no abnormal reaction being produced. Dr. Drysdale then gave him 12 intramuscular injections of mercurial cream at intervals of seven days. I then gave him two injections of neosalvarsan at an interval of 48 hours. After the first dose the temperature rose to 99·9° F., and after the second to 100·9°. Twenty-four hours after the second dose the temperature was 100·4°, and 48 hours after the second dose it was 99·6°, after which it became normal. The patient vomited frequently for four days following the second injection, and was unable to retain anything given by the mouth. As I had on several previous occasions tested vomit for arsenic, and found it present in considerable quantities, and as I think it advisable that a considerable quantity of fluid should be taken after salvarsan (so as to assist in the elimination of the drug by the kidneys and to reduce the risk of nephritis), notwithstanding the vomiting, I gave the patient barley water in considerable quantities. I thought that what he absorbed would assist in washing out the kidneys, and what he vomited would remove the arsenic excreted by the stomach. After four days, however, as the patient was becoming extremely weak, I asked Dr. Cyril Ogle to give me the benefit of his advice on the case. Dr. Ogle advised two-hourly feedings of a mixture of milk and albumin-water, commencing with doses of 1 oz., and increasing in frequency and quantity if the vomiting stopped. This treatment had the desired effect, and after 12 hours the vomiting had ceased. During the last two days, however, some conjunctivitis had developed. I wish to draw special attention to this symptom, as it has occurred in several of my patients who have shown intolerance to the drug, and I consider that it is an early sign of such intolerance. On the day following the cessation of the vomiting, the sixth day after the second injection, the urine, which had previously been normal in character and quantity, was found to contain albumin. During the next day (the seventh) 12 oz. of urine were passed containing 0·15 per cent. of albumin; acetone was also present. On the following day (the eighth) 14 oz. were passed containing 0·1 per cent. of albumin, and less quantity of acetone; the following day (the ninth) 30 oz. of urine and 0·05 per cent. albumin and no acetone; the next day (the tenth) 2½ pints and no albumin. With the occurrence of the albuminuria the patient became lethargic; the condition was one of lethargy rather than coma, as the patient never lost consciousness and could always be roused sufficiently to give an intelligent answer. The lethargy, however, became so complete that the patient developed incontinence of fæces. He first complained of headache 12 hours after the second injection; the pain in the head rapidly became very acute, and persisted until the onset of the lethargy. During the second, third, and fourth days the patient appeared extremely depressed and hysterical, and had frequent attacks of weeping. On the eleventh day he awoke, after a restful night, feeling quite well; all symptoms had passed off, and complete recovery ensued. The pupils were equal and reacted to light throughout. Dr. Ogle saw the case several times, and, notwithstanding the symptoms, was always of the opinion that the patient was not in such a desperate state as he seemed to be, and that he would recover.

The case appears to have been one in which the kidneys and meninges were both affected by the drug.

The second case was that of a healthy man with secondary syphilis. After the first dose a rigor occurred after a lapse of half an hour, and the temperature rose to 102·2° F., which, however, fell to normal within 12 hours. The second injection was given after an interval of a week; 25 minutes after the injection a rigor occurred lasting 15 minutes, the temperature rose to 103·6°, the pulse was feeble, and the patient had the aspect of shock. Within 12 hours the temperature had fallen to normal, and no other symptom occurred.

The third case was one of early tabes, in which the patient received the second injection four days after the first. As frequently occurs with tabetics, reaction was delayed, and 30 hours after the second injection the temperature rose to 101° F. Twelve hours afterwards the temperature was 100°, where it remained for 24 hours; 48 hours after the injection the temperature began to mount, and rose to 102·5°. On the second day after the second injection slight conjunctivitis appeared, and on the third day the patient was covered with a bright, measles-like rash. There were no rigors and no albuminuria. Dr. James A. Torrens saw the case with me and considered that the rash was due to arsenic, and he told me only recently that he has since seen a similar case. I have also seen a case reported of the occurrence of measles three days after salvarsan, from which the author concluded that salvarsan did not prevent the onset of measles. Perhaps in this case also the rash and conjunctivitis were produced by the salvarsan.

The fourth case was that of an early thoracic aneurysm, in which the patient had been on restricted fluid for several weeks, under the care of Dr. Ogle at St. George's Hospital. At Dr. Ogle's request I gave him 0·3 grm. of salvarsan, which was followed by no reaction. Four weeks later I gave him 0·6 grm., which was followed two hours later by a rigor and vomiting, and the temperature rose to 99° F.; there was also considerable thoracic and abdominal pain. Six hours after the injection the temperature was 101°, and an intermittent temperature between 99° and 100° persisted for eight days. During the night following the injection acute conjunctivitis developed, causing the patient considerable distress. The conjunctivitis cleared up with appropriate treatment, but persisted in a slight degree for several days after the injection. The patient vomited three or four times a day for the first three days following the injection, and then once a day for the next three days. Jaundice began to appear on the fourth day, gradually becoming deeper until the tenth day, after which it slowly passed off. The urine examined three days after the injection was found to contain a trace of albumin, which persisted for a week. No arsenic could be detected in the urine in a specimen taken a week after the injection. Vomiting occurred again on the tenth, eleventh, and fourteenth days. Appetite was entirely absent until the sixteenth day, when all symptoms cleared up, leaving the patient feeling extremely well. Dr. Ogle treated the case with continuous irrigation of the bowel, with a view to assisting the elimination of the arsenic. In this case probably the toxic symptoms were occasioned by the high concentration of the blood following the restriction of the fluid taken.

The fifth case was that of a man in which little reaction followed injection and no rise of temperature. Three hours after the injection the patient became breathless and cyanosed, this condition passing off in about ten minutes. I consider that this must have been due to a partial pulmonary embolism.

In my own practice, therefore, I have had five cases out of 500 (1 per cent.) that have given cause for anxiety. All these five cases, with the exception of the partial pulmonary embolism, occurred after my book was in the press.

Other symptoms that I have occasionally met with, but which have not been of sufficient severity to cause any anxiety, have been rise of temperature, vomiting, rigors, headache, phlebitis, thrombosis, diarrhœa, colic, jaundice (once), cardiac symptoms (once, in a case of aortic regurgitation), conjunctivitis, herpes (once), slight transient albuminuria (three times), and pain in the epigastrium, back, abdomen, or limbs.

Major French and others have stated that salvarsan treatment involves a danger of blindness. This fear seems absolutely without foundation, and neither in my own practice nor in the practice of the hospitals with which I am connected have I met with a single case of blindness produced by salvarsan, and this is also the experience of

Major Gibbard and Major Harrison at the Military Hospital, Rochester-row.

Fever to some degree is the most constant symptom and occurs in about 30 per cent. of cases. Wechselmann has pointed out that salvarsan fever may be caused by contamination of the saline solution, and not be due to the salvarsan; and numerous observers, working independently, have since confirmed this theory. Contamination with bacteria or their products is not, however, responsible for all cases of fever, and even if the solutions are prepared and administered with every possible care, cases of fever occasionally occur. A considerable rise in temperature most constantly occurs in cases of florid syphilis, and I am in agreement with Schreiber, who advanced the theory that this temperature was due to the setting free of the endotoxins contained in the bodies of the destroyed spirochætæ. Rigors are rare and do not occur in more than 5 per cent. of cases; they usually arise from half an hour up to two hours after the injection. Vomiting occurs rather more often and at about the same time. Headache is met with in a considerable number of cases. Diarrhœa and constipation are occasional effects of treatment; the former occurs after injection, the latter after a few days; neither is, as a rule, of serious import.

A temporary exacerbation of an existing skin eruption, the so-called Jarrisch Herxheimer reaction, is occasionally met with. Two hours after the injection cutaneous lesions become deeper in colour and are more pronounced. This effect reaches its highest point in from 12 to 24 hours, and then gradually passes off. A sense of cardiac oppression, sometimes going on to syncope and throbbing in the head, has been described as occurring at the time of the intravenous injection, but I have not met these symptoms in properly prepared cases.

Perhaps one should add amongst the after-effects the results of faulty technique in administration, so that all the salvarsan does not pass into the blood stream, but some of it escapes into the tissues surrounding the vein. Such leakage may produce considerable aseptic infiltration, accompanied by pain, swelling, phlebitis, and thrombosis.

Precautions to be Taken to Avoid Complications.

The precautions to be taken in order to render the occurrence of these dangerous, alarming, or unpleasant symptoms minimal may be grouped under four headings: (1) The preparation of the patient; (2) preparation of the solution and correct technique of administration; (3) the after-treatment of the patient; and (4) interval between the injections.

Preparation of the patient.—The blood pressure should be lowered so that the vascular system may be enabled, without effort, to accommodate the additional 400 or 500 c.c. of fluid. It is obviously incorrect to assume, because a patient in a state of shock, with his blood pressure extremely low, is able to accommodate two or three pints of fluid without trouble, that when his blood pressure is normal no unpleasant symptoms will follow the introduction of a pint of fluid.

I have only had one case of serious collapse immediately after injection, and in this case I found that, owing to a misunderstanding, the patient had not been prepared and had had a meal one hour before the injection. My usual routine is to administer a pill the night before and a brisk saline purge on the morning of the injection, and no food or drink whatever is permitted for five hours before the injection.

Preparation of the solution and correct technique of administration.—The solution should be prepared immediately before use. Only freshly distilled water should be employed in the preparation of the saline solution, which should be prepared and sterilised within a couple of hours of administration. I think a simple infusion apparatus is preferable to a syringe. If during the injection of the salvarsan solution any local swelling develops at the site of injection or the flow stops, the clip should be at once applied to the tubing and the needle removed, and hot fomentations applied to the area in question, so as to assist the removal of any salvarsan solution that may have escaped into the tissues around the vein.

After-treatment.—I keep the patient in bed for 24 hours and then allow him up, provided that the temperature is normal, the site of the injection free from all phlebitis, and no albumin in the urine. If there is any temperature I advise the patient to remain in bed until the temperature has been normal for 24 hours. I forbid alcohol for a week after the injection. The patient is encouraged to drink large quantities of barley water for 48 hours after the injection, and only a milk diet is permitted for the first 24 hours.

Pulmonary embolism and its consequent alarming symptoms can usually be avoided by keeping a careful look-out for phlebitis and thrombosis in the vein receiving the injection, and, if they occur, by insuring absolute rest to the limb and by the application of lead and opium fomentations.

Interval between the injections.—Since the occurrence of meningitis and nephritis in the case I first mentioned I have not given a second injection at a shorter interval than one week, and so have altered my procedure from that which I advocate in my book on the "Clinical Pathology of Syphilis and Parasyphilis," in which I recommend that the doses should be given at intervals of 48 hours. I based this opinion on a considerable number of cases in which at that time no untoward result had been obtained. If a patient shows any symptoms of intolerance to the drug I advise a month's interval between injections.

I use a Marsh's apparatus and some filter paper soaked in silver nitrate to enable me to make a rough guess at the amount of arsenic that is being eliminated, and it is advisable that the second dose should not be given while arsenic is present in the urine.

Conclusions.

The large amount of evidence now at our disposal points clearly, in my opinion, to the following conclusions:

1. That the risk of death is so small that if due care is taken in preparation of the patient, and no errors are made in preparation of the solution of the drug, technique of administration, interval between injections, or subsequent treatment, fear of death cannot justifiably be advanced as a reason for withholding salvarsan treatment.

2. That the slight risk of serious complications or sequelæ is more than counterbalanced by the therapeutic results obtained.

3. That all sufferers from syphilis, in whatever stage, and all cases of early parasyphilis should, as a matter of routine, be permitted the advantage of salvarsan treatment.

Upper Berkeley-street, W.

A CASE OF PHTHISIS WITH COMPLETE CAVITATION OF THE LEFT LUNG.

BY D. W. CARMALT JONES, M.D. OXON., M.R.C.P. LOND.,
SENIOR ASSISTANT PHYSICIAN, WESTMINSTER HOSPITAL;
AND
E. S. WORRALL, M.R.C.S. ENG., L.R.C.P. LOND.,
MEDICAL OFFICER IN CHARGE OF ELECTRICAL DEPARTMENT, WESTMINSTER HOSPITAL.

THE patient, a female, aged 21, married, attended Westminster Hospital for phthisis in September, 1912. She had had good health until one year previously, when a child had been born; six weeks after parturition she had a severe attack of pneumonia and was ill for four months; she never recovered her health, but had a continual cough and occasional night sweats, and steadily lost weight; she had profuse expectoration, especially in the early morning, but no hæmoptysis. The child died from tuberculosis when a year old.

On examination there was extreme wasting: the weight was 6 st. 7 lb., and was stated to have been 10 st. 4 lb. three years before. No abnormality was detected in the alimentary, nervous, or excretory systems. The chest was much wasted; the heart appeared normal in position, but the left border could not be made out owing to dulness involving the whole left lower lobe; there were no adventitious sounds, but the pulmonary second sound was much accentuated. There was some respiratory distress with overaction of the accessory muscles, which was much increased on the least exertion, and there was some limitation but not abolition of movement on the left side. The right side was resonant throughout; the left upper lobe was resonant, but from the fifth rib downwards the lower lobe was extremely

dull in front and at the side, but not quite so dull behind. The breath sounds were very harsh throughout, cavernous over a part of the right upper lobe in front, and cavernous over the left upper lobe. There was no air entry over the dull area of the left lobe at the side and in front, but weak breath sounds were heard behind. There were no adventitious sounds, and the voice was feeble, so that vocal

FIG. 1.

Section through right lung showing large cavities in upper lobe and extensive fibrosis.

resonance and fremitus gave no reliable signs. Expectoration only occurred in the early morning, when some ounces of extremely viscid sputum, all forming one continuous mass, were brought up, in which tubercle bacilli were very numerous.

In December the patient grew rapidly worse, the larynx became severely affected, and it was difficult to take food. The liver grew tender and much enlarged, reaching two or three inches below the costal margin; a little albumin and numerous casts appeared in the urine, but there was no amyloid reaction. The temperature was not much disturbed till the last weeks of life, generally varying between 98° F. in the morning and 99° at night, never exceeding 100° while under observation, and sometimes not varying half a degree throughout the day. On Jan. 7th, 1913, however, an unsuccessful attempt was made to explore the chest, and severe coughing was induced. After this the condition grew rapidly worse, the temperature varied between 101° and 97°, there was a marked hectic flush, vomiting occurred, there was incontinence of fæces, the breath became excessively foul, and on Jan. 22nd the patient died.

Report by Mr. WORRALL.—*Radioscopic examination.*—Patient sitting. One was at once struck by the intenseness of the X-light reflex of the upper part of the left chest, terminating below near the middle of the lung in a sharply defined horizontal line, below which the light reflex was markedly diminished. On making the patient incline to either side, the line separating the light and dark areas remained horizontal in all positions. A slight disturbance of the horizontal line synchronous with the pulse could be made out. The heart was not seen, being lost in the dark area of the lower part of the left chest. No movement of the diaphragm could be made out on this side. The right lung showed a large vomica near the apex; the light reflex here was almost equal in intensity to that of the upper part of the left chest. Over the rest of the right lung the reflex was markedly diminished and the lung presented a mottled appearance. The diaphragm excursion was much limited. From the above screen examination I concluded that this was a case of tuberculosis affecting the whole of

FIG. 2.

Left lung laid open, showing much thickened pleura and complete cavitation.

FIG. 3

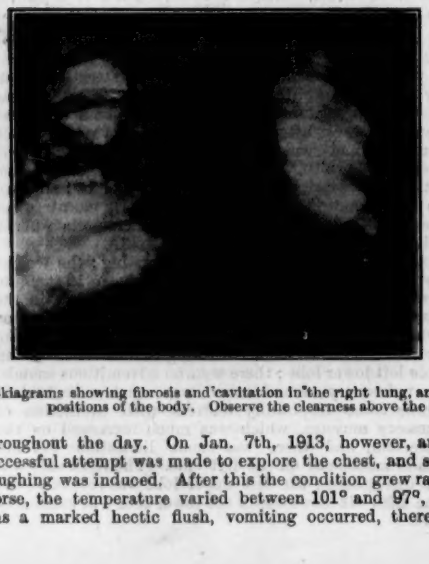
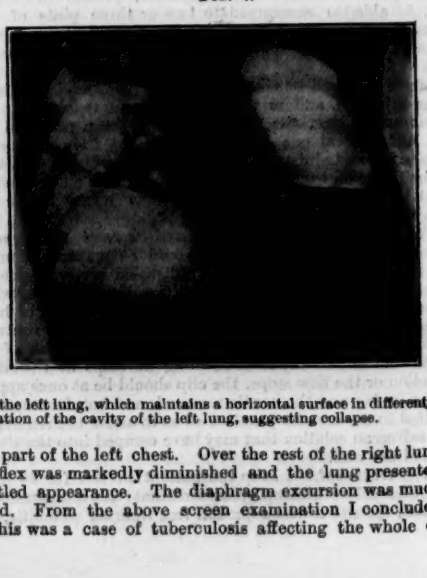


FIG. 4.



Skiagrams showing fibrosis and cavitation in the right lung, and free fluid in the left lung, which maintains a horizontal surface in different positions of the body. Observe the clearness above the fluid in the situation of the cavity of the left lung, suggesting collapse.

the right lung, there being a large vomica near the apex, whilst on the left side there was a pneumohydrothorax. I then took the radiograms. (Figs. 3 and 4.)

Radiographic examination.—(*a*) Plate in front of chest; patient standing erect; exposure 3 seconds. (*b*) Plate in front; patient standing and inclined to the right; exposure 3 seconds. These plates confirm what was made out in the screen examination, and show the right lung to be diseased throughout and presenting a large vomica near the apex. There is no shadow of lung tissue in the bright area of the left side. The mediastinal shadow seems to project somewhat to the left of the spine, and this I thought to be due to collapsed lung tissue. In the lower part of the dark area of the left side the plate shows a curved line convex downwards and limiting the densest part of the shadow, which for the moment made me wonder if this could mean that the fluid was in the pericardium, which in that case must be perforated to be in communication with the atmospheric pressure. I thought, however, the curved line might be caused by the mamma throwing its superadded shadow; a similar line, though less well marked, is to be seen on the right side. On investigating with the screen and moving the mamma this was found to be the explanation, and I put the appearances down as due to pneumohydrothorax.

Post-mortem examination.—This examination was made by Dr. J. A. Braxton Hicks, and the points of interest were as follows. The larynx was much infiltrated, the epiglottis and cords nearly destroyed. Both pleurae were adherent throughout. The right lung showed universal chronic tuberculosis and a large cavity in the upper lobe. (Fig. 1.) The left lung was almost completely destroyed; it was merely a bag, communicating with the trachea through a bronchus, adherent to the chest wall, and about half full of fœtid pus. (Fig. 2.) The liver weighed 64 oz., and that and the spleen showed the amyloid reaction. There were several tubercular ulcers of the lower end of the ileum and the head of the cæcum.

The necropsy was necessary to reconcile the physical signs and X ray pictures in this case. From the latter the diagnosis of hydropneumothorax appeared almost certain. The physical signs, however, never agreed with this, since the left chest moved with respiration and air could be heard to enter—in fact, in the upper lobes little difference could be heard on the two sides, and the classical signs of pneumothorax—namely, resonance and silence—were certainly absent. But in examination of the chest in any case in which there is extensive disease of the larynx the auscultatory signs are likely to be deceptive.

The physical signs indicated fluid in the left chest; the X rays showed that air and fluid were present together, and suggested that the lung was collapsed; there was, however, undoubted air entry into the left lung, and it is easy to see now, in the light of the post-mortem findings, that the signs were those of an undoubtedly rare condition—namely, complete cavitation of the entire lung.

A METHOD OF COUNTING BACTERIA IN WATER.[1]

BY R. DONALD, B.Sc. N.Z., D.P.H. OXF.

With Remarks upon the Bearing of the Method upon the Subject of "Saline Fever," by PAUL FILDES, M.B., B.C. Cantab.

(*From the Bacteriological Laboratory, London Hospital—Professor W. Bulloch, F.R.S.*)

IN a recent number of the Proceedings of the Royal Society[2] is published a short article on my apparatus for the measurement of liquids by drops. The article concludes with a list of practical applications of this drop-measuring method. One of these applications, the enumeration of bacteria in water, has been more fully worked out during the last couple of months, with results that not only are of special interest in connexion with (so-called) "saline fever," but also are of general practical importance in the many processes in which water is concerned.

This method of enumerating bacteria in water consists in taking a small definite-sized drop of the water, drying it in a circular patch on a slide, fixing effectively the circular film, staining clearly the bacteria present, and counting them under the microscope. The definite size of the drop is determined by the outer circumference[3] of the vertically held clean glass pipette at the level where the drop-surface curving upwards and inwards joins the outer surface of the pipette point and clings round it. This particular size of pipette gives exactly that definite-sized drop of that liquid only at a particular rate of dropping and a particular temperature.

The pipettes are gauged to any particular size required in the proper hole of a steel gauge plate such as is used for wire. The gauge sizes most used in the work here described are as follows, the drop-rate being one per second and the temperature 20° C.:—

	Size.	Diam. mm.	Corresponding to drops of water each.
Morse drill and wire gauge ...	77	0·457	1/101 c.c.
	80	0·34	1/131 c.c.
French draw-plate	8	0·29	1/173 c.c.

The pipettes are drawn, e.g., in a Bunsen large by-pass flame from glass tubing about 3 mm. in external diameter, and are gauged by gently pushing the capillary part down through the proper hole till arrested. Then with a glass-cutting knife the capillary is cut off close to the upper surface of the plate. The capillary ought to be very nearly cylindrical—i.e., not sharply tapering—at the part arrested in the gauge hole. The knife as well as the gauge plate and holes ought to be thoroughly freed and kept free from grease. Also the capillary end of the pipette must be touched by nothing but grease-free cotton wool or clean blotting paper.

The slow well-controlled rates required can, in dropping merely a few drops, be attained very conveniently by using the hand pattern of the mercury plunger tube.[4] In use this is held at such an angle that the drop-rate is not faster than one per second. At all rates slower than one per second a dropping-point as small as 0·3 mm. in external diameter yields of a given liquid at a given temperature drops that are practically constant in weight.[5]

It is desirable that the drop of bacterial liquid, when deposited on the slide, should dry in a circular sharp-edged patch. This is secured by polishing with a clean cloth the rinsed slide and thus imparting a slight degree of greasiness. On such a surface a bacterial liquid, especially if slightly alkaline, will usually dry in a uniform film. The edge is most strongly marked when the drop is dried at a uniform gentle heat. Such drying is suitable for distilled water.

If the dried film contains more than a mere trace of dried salts only, some of the bacteria are deposited directly on the glass slide so that they can be fastened to it by a suitable fixing process. Now if such films are to be stained clearly—that is, if they are to be stained after drying—the bacteria, especially those deposited on the dried salts, must be held together by a suitable reticulum, so that when the salts are dissolved away the bacteria shall not also be washed away. Such a reticulum may be formed by adding to the liquid, before dropping and fixing, a trace (1 in 300) of 12 per cent. gelatin medium, of hydrocele fluid, or of egg-white (diluted and filtered through cotton wool to remove the globulin). Such toughened films have a too strongly staining edge unless they are dried cold under the air-pump.

Of course, the bacteria may be stained before dropping by adding a small quantity of bacteria-free methyl-violet solution and heating for a few minutes in a bath at 60° C. But the drop when dried has so many stain-granules and sharp circular droplets of stain that even an approximate count demands much careful scrutiny and much time.

[1] The main part of the matter of this paper, with a demonstration of bacteria stained in distilled water, was communicated to the Pathological Section of the Royal Society of Medicine at the laboratory meeting on March 4th, 1913.

[2] Donald: Proceedings of the Royal Society, Series B, vol. lxxxvi., 1913, p. 198.

[3] Only the outer measurement of the pipette need be taken into account unless, as is rarely the case, the liquid is acid in reaction. In this case, to allow free passage of the colloids, the internal diameter of the capillary ought to be not less than 0·17 mm. Sahlbom: Colloid-chemische Beihefte, 1910, ii., 79. But so small a nozzle as 0·25 mm. in outer diameter allows acidified diluted vaccines to pass as freely as the same dilution alkaline in reaction.

[4] Made thus: A piece of clean dry tubing 12 to 15 mm. long and 1¼ or 2 mm. bore is opened out slightly funnel-shaped at each end, one end is tightly plugged with grease-free cotton-wool, the tube is filled two-thirds with clean mercury, the other end is tightly plugged with cotton wool, and a short piece (about 3 cm.) of rubber tubing is fitted for attachment to the small pipettes.

[5] Ollivier: Annales de Chimie et de Physique, série 8, tome x. (1907), p. 2. Donald: Proceedings of the Royal Society, Series B, 1913, vol. lxxxvi., p. 198.

This method, used in April, 1912, in counting the bacteria in distilled water for Drs. Fildes and McIntosh,[6] showed 350,000 and, later, 750,000 bacteria per cubic centimetre.

Then I learned from Professor Paul Th. Müller's report[7] of similar counts by his method of estimating the bacteria in distilled water that he also found the granules of dried stain to demand careful scrutiny. So I devised a method of obtaining stronger clearer staining of the bacterial film without any deposit of disturbing granules and without loss of bacteria. Professor Müller's method and my method differ considerably in the quantities of water taken for a test—namely, 100 c.c. and 1/100 c.c., and in other respects. Professor Müller's method consists in taking a 100 c.c. vessel specially cleaned, precipitating all or nearly all the bacteria from this volume of water by adding liq. ferri oxychlorati (P.G.), with formalin to prevent multiplication of the bacteria during the process, which is said to take from start to finish less than an hour. After mixing and standing from a quarter to half an hour the liquid is decanted, and the sediment, with gentian violet solution now added, is heated and then centrifuged down to 1 c.c. of precipitate, of which 0·02 c.c. is measured by a graduated pipette, spread by a platinum loop to an area of one square centimetre on a special slide, dried, and estimated under a specially adjusted microscope.

The drops, dried as above described, are fixed for a few minutes with a water-free fixative—namely, an absolute alcohol solution either of phenol (10 per cent.) or of $HgCl_2$ (5 per cent., or less), or of absolute formaldehyde. Then, after rinsing away with absolute alcohol the excess of the fixative, the films are gently pressed with clean blotting paper, dried by warmth, and stained for one minute with carbol-fuchsin (made with bacteria-free water). The carbol-fuchsin is kept thoroughly covering the films until it is displaced by rinsing with 10 per cent. alcohol in bacteria-free water.[8] Then the film is again blotted.

If the dried matter on the periphery of a film of distilled water adsorbs stain droplets which roughly simulate cocci, the fully fixed dried films may, before staining, be covered for a minute with 10 per cent. alcohol in bacteria-free water. This is simply poured off before putting on the carbol-fuchsin, which may now be safely allowed to act for a couple of minutes before being displaced by the rinsing with 10 per cent. alcohol. This treatment stains the bacteria strongly though cleanly, while the few dots of adsorbed stain marking the outline of the drop are transparent and shaded off.

The warm films are covered with the minimum mounting quantity of vaseline which holds a cover-glass by capillary attraction. Cedar oil, which in contact with the film will largely decolourise it in a few hours, can of course be kept on the upper surface of the cover-glass as long as desired.

Alkaline mineral waters and sewage effluents dry with so much stain-adsorbing granular matter that the bacteria are largely hidden. But the drop-film toughened by added gelatin or albumin or by collodion,[9] if washed gently with 0·01 per cent. HCl, then with bacteria-free water, and stained as above, shows the bacteria clearly and strongly stained on the lightly tinted background.

Counting is conveniently done by the aid of a low compensating ocular furnished with a square diaphragm divided into three or four strips by lines of fine black human hair or of wire. These lines are better kept across the field, as it is brought in by a mechanical stage. With the Leitz 1/12 oil immersion lens e No. 4 compensating ocular was found to give a particularly flat field and sufficient magnification. Indeed, with good sharp clear films, as yielded by the carbol-fuchsin method described, a Leitz 1/10 oil immersion lens with No. 4 compensating ocular was found very serviceable, especially in counting right through a drop-film. But only in specially exact enumerations is it necessary to count right through a drop-film. Usually it suffices to make an estimate from the area of the film and the average number of bacteria per square field.

If the drop dries in the form of a ring rich in bacteria surrounding a disc poor in bacteria, the count for the ring and the count for the disc may be estimated separately and added together.

To economise searching for the upper and the lower limits of the field-strips, especially where the boundary of the drop is poorly marked, it is a good plan to begin by "taking the bearings" of the extreme limits of two diameters of the drop-film by the vernier readings.

If the film forms a practically uniform disc its area can be very readily worked out in units of a square field area. To take an actual example—the saline of Jan. 31st, 1913, mentioned later.

The drop (Morse 77) has a mean diameter of 8·05 mm., as measured by the verniers on the two movements of the Leitz mechanical stage. The side of the square field seen with compensating ocular 4 and 1/12 inch oil immersion objective subtends 0·135 mm. on a stage micrometer.[10]

So the average diameter of the drop $= \frac{8{\cdot}05}{0{\cdot}135} = 60$ such field-sides.

Area of drop $= \pi r^2 = \frac{22}{7} \times \frac{30}{1} \times \frac{30}{1}$ fields.

Every fourth field on the antero-posterior diameter of the drop was counted. These 16 fields in all showed bacteria numbering from 37 to 70, and averaging 57 per field. On the right to left diameter the counts of 16 fields ranged from 33 to 69, and averaged 50 per field.

Thus the average of 32 fields was 53·5 bacteria. And the liquid (plain saline) gave about 101 drops per c.c. So the number of bacteria per c.c.

$$= \frac{22}{7} \times \frac{30}{1} \times \frac{30}{1} \times \frac{53{\cdot}5}{1} \times \frac{101}{1} = 15{\cdot}30 \text{ millions.}$$

Another (Morse 77) drop of the same saline, toughened with egg albumin, gave 15·61 millions per drop. Two "draw plate 8" drops gave 15·06 and 15·75 millions.

Thus, although the number of bacteria present in a whole drop was too large for counting throughout, yet the average number per field obtained by counting some 30 fields in each drop gave results that were concordant within 2 per cent. of their average, 15·43 millions.

Besides the two counts already mentioned there have been made since Jan. 3rd, 1913, the following counts of bacteria in distilled water and in saline:—

Jan. 3rd.	Preliminary count before experiments with the water:—		
	Distilled water from glass cistern ...	1,020,000	Bacteria per c.c.
,, 6th.	Distilled water handed to me by Dr. Fildes...	1,500,000	
	The same water filtered	None	
	The same water redistilled	,,	
Jan. 8th.	Distilled water from filled-up flask ...	510,000	
	The same water autoclaved	276,000	

In this and in other autoclaved water there appeared a good deal of bacterial débris.[11] The number of bacteria left unbroken after autoclaving depends apparently on the kind of bacteria present.

Jan. 9th.	Distilled water from receiver tank of dispensary still	5000	Bacteria per c.c.
	The same water filtered	None	

This receiver-tank water, kept till Jan. 31st, showed then a remarkable bacterial increase.

Jan. 23rd. Distilled water from glass cistern for counting, autoclaving, and plating out:—

Distilled water	608,000	Bacteria per c.c.
The same water autoclaved and counted on date	562,000	
The same autoclaved water kept till Feb. 18th	536,000	

Thus only a few bacteria in the autoclaved water disappeared in nearly four weeks.

Plated out on gelatin at 18° C.—

In two weeks 0·00018 c.c. showed 29 colonies, i.e., 161,000 colonies per c.c.
while 0·000018 c.c. ,, 3 ,,

Thus one colony grew for four bacteria seen in the water. In this and in other plating-out experiments no colonies at all were visible before the third day.

Jan. 24th.	Distilled water from glass cistern ...	536,000	Bacteria per c.c.
	Another count	546,000	

Gelatin plates two weeks at 18° C. gave 100,000 colonies per c.c.—i.e., one colony per 5 bacteria seen.

[6] McIntosh, Fildes, and Dearden: Zeitschrift für Immunitätsforschung, Band xiv. (1912), Orig., 137.

[7] Preliminary report, Münchener Medizinische Wochenschrift, 1911, Nr. 47. Detailed report, Archiv für Hygiene, Band lxxv., 1912, Hefte 4 and 5.

[8] Ordinary distilled water with 10 per cent. alcohol may be used. If the rinsing is final (i.e., not followed by further staining), and if it rapidly but gently displaces all the free carbol-fuchsin, and if the film is promptly dried, then any bacteria in the water escape being stained.

[9] The drop-film is impregnated with collodion by standing the slide upright for a minute or so in B.P. collodion diluted with 8–9 parts of alcohol and ether, and then hanging the slide clipped by its upper end to dry. The delicate collodion film may be washed and stained as long as the liquids are not allowed to get under its free edge.

[10] A Thoma hæmocytometer slide with the ruled area "mounted" in water and covered with a small piece of No. 1 cover-glass will serve as a stage micrometer for the oil immersion lens in observing the size of the square field.

[11] The distinguishing of, e.g., bacterial débris by even an ordinary achromatic 1/12 inch objective can be promoted by recognised devices that are often neglected: (1) critical illumination; (2) monochromatic light; and (3) oiling the condenser to the slides.

Jan. 31st.	Saline "from dispensary receiver-tank water (which was collected on Jan 9th," and which showed then 5000 bacteria per c.c.) handed to me by Dr. Fildes on date, gave estimations of various preparations as shown:—	15,300,000 15,610,000 15,060,000 15,750,000	Bacteria per c.c.
Feb. 3rd.	Distilled water being filtered by Dr. Fildes	1,000,000	Bacteria per c.c.
Feb. 6th.	Distilled water being filtered by Dr. Fildes	2,400,000	
	The same water autoclaved on Feb. 6th.	380,000	
	The same water filtered	None	

The same water plated out on gelatin for two weeks at 18° C. gave 194,300 colonies per c.c.—i.e., one colony for 12 bacteria seen.

The above results show that ordinary laboratory distilled water contains a million or more bacteria per c.c., and that such water kept for three weeks may contain as many as 15 millions of bacteria per c.c. By plating out on gelatin medium at about 18° C. the number of colonies obtained was only 1/4 to 1/12 that of the bacteria seen in the dried stained preparation. These results accord with those found by Professor Paul Th. Müller with his method.

I am much indebted to Professor W. Bulloch and Professor Leonard Hill for valuable criticism and assistance in the working out of my drop-measuring method and of its applications. Also I have to thank the administrators of the London Hospital Medical College Research Fund for a grant towards the expenses of this research.

Summary.—This method of counting the bacteria in water is one of numerous applications of the author's apparatus for measuring liquids by drops.[13] By means of rapidly gauged pipettes and a "mercury plunger tube" small definite-sized drops of water containing bacteria are accurately delivered on a polished slide, and are then dried and fixed. The bacteria are then stained strongly and clearly without the presence of disturbing granules of dried stain. By means of a square diaphragm with parallel hair-lines either the drop is counted throughout under the microscope or else a rapid estimate is made from (1) the area of the drop in fields, (2) the average number of bacteria per field, and (3) the known volume of the drop. By this method it was shown that distilled water kept for three weeks may develop as many as 15,000,000 of bacteria per c.c. The results obtained accord with those obtained by Professor Paul Th. Müller with his method.

Remarks upon the Bearing of the Method upon the Subject of "Saline Fever," by Dr. PAUL FILDES.

The method devised by Mr. Donald for demonstrating the presence of living or dead bacteria in water has an interesting bearing upon the subject of "salt fever." It may be recalled that the occurrence of fever after the injection of saline solution, either subcutaneously or intravenously, has been noted by many, and that various explanations of the phenomenon have been advanced. The subject came into more prominent notice when salvarsan began to be administered intravenously on a large scale, and the suggestion was put forward by Wechselmann that the salvarsan fever was due to living hæmolytic bacteria growing in the saline solution and fostered by his habit of keeping the inadequately sterilised water in the incubator to be ready for use. Dr. McIntosh and I had been investigating the matter ourselves, and although Wechselmann's suggestion was not acceptable (our solutions being sterile), nevertheless his paper led us to experiment upon the properties of the saline solution without the addition of salvarsan.

We, of course, confirmed the view that sterile saline alone produced fever, but were also able to show that the fever-producing body was entirely removed by redistilling the water used for the manufacture of the saline. We tended at one time to the belief that this toxic body was of mineral origin and was derived from the tin still from which the water was originally obtained. We, however, soon abandoned this opinion when we found that the water as collected straight from the tin still was quite non-toxic. We next turned our attention to the question of bacterial contamination of the water as it lay in the laboratory, and found that it contained a large number of bacteria. This finding was looked upon as abnormal by Freund, but it is now generally known that distilled water as stored in laboratories or elsewhere normally contains large numbers of bacteria. Although, then, our water was found to be contaminated with bacteria they were nevertheless undoubtedly killed by heat before being injected, and thus we did not think they could be the cause of the violent symptoms sometimes seen after the injection of saline. However, we filtered the toxic water through a Doulton filter and found the filtrate quite non-toxic, and were thus forced to believe that the toxic symptoms were due to the actual presence of the bacterium itself.

To some extent our work has been confirmed by the investigations of Mr. E. C. Hort and Dr. W. J. Penfold, of the Lister Institute, although it must be admitted that they differ from us on very material points. Among these material points is the rôle of the bacterium in the causation of fever. We stated that the bacterial protein was the cause, while they hold "that the presence in water or saline of a filter-passing pyrogenetic substance, which may or may not be a product of bacterial protein, is an important factor in the production of" fever. They would not accept the bacterial origin of the fever entirely, because they found that the fever produced was inversely proportional to the number of bacteria in the water. They give an experiment showing the production of fever by water containing a small amount of bacteria (40 per c.c.), while no fever was produced by highly contaminated water (950,000 per c.c.).

Without in this place discussing their other reasons for criticising us, I wish to point out the cause of the apparent lack of relation between the number of bacteria and the amount of fever observed by them. It is clear that when the number of bacteria in a sample of water is to be estimated two separate methods are available: one the method of Donald, in which the bacteria are directly counted under the microscope, and the other the method of estimation by culture. This second method has many disadvantages. For instance, it will ignore dead bacteria, which are, however, as important in connexion with fever as living bacteria. Further, it will ignore the many bacteria which will not grow upon the various media available. Wide differences may be found in the estimated number of bacteria in water through differences in technique. The temperature of growth, the duration of observation and differences in media have all an important bearing. Broadly, it may be said that the method used by bacteriologists is to grow the bacteria upon gelatin plates at 18°–22° C. for 10 to 14 days before counting the colonies: the method used by Mr. Hort and Dr. Penfold, however, is to grow the bacteria upon *agar plates at 37° C.* for *two days*. The effect of their technique is, of course, readily demonstrable. From a sample of water grown on gelatin at 18° C. the following results were obtained by me:—

Jan. 6th, 1913: The water was plated out on three gelatin plates in the following quantities—1/1000 c.c., 1/10,000 c.c., and 1/100,000 c.c. Average temperature of growth, 18° C.

Jan. 7th (24 hours): The three plates had grown no colonies.

Jan. 8th (2 days): The three plates had grown no colonies.

Jan. 9th (3 days): The 1/1000 c.c. plate had grown 9 colonies; 1/10,000 c.c., 5 colonies; 1/100,000 c.c., 1 colony.

Jan. 10th (4 days): 1/1000 c.c., many colonies; 1/10,000 c.c., 7 colonies; 1/100,000 c.c., 1 colony.

Jan. 11th (5 days): 1/1000 c.c., many colonies; 1/10,000 c.c., 9 colonies; 1/100,000 c.c., 1 colony.

Jan. 13th (7 days): 1/1000 c.c., many colonies; 1/10,000 c.c., 10 colonies; 1/100,000 c.c., 1 colony.

Jan. 15th (9 days): 1/1000 c.c., many colonies; 1/10,000 c.c., 12 colonies; 1/100,000 c.c., 2 colonies.

Jan. 16th (10 days): 1/1000 c.c., many colonies; 1/10,000 c.c., 13 colonies; 1/100,000 c.c., 3 colonies.

Jan. 20th (14 days): 1/1000 c.c., many colonies; 1/10,000 c.c., 16 colonies; 1/100,000 c.c., 3 colonies.

It thus follows that water which Mr. Hort and Dr. Penfold would pass as being free from bacteria actually contained by the method of culture 160–300,000 bacteria per c.c. Further, when the method of Mr. Donald was applied to the same sample it demonstrated the presence of no less than 1,500,000 bacteria per c.c.

It is, therefore, quite clear that any statements made by Mr. Hort and Dr. Penfold as to the presence or absence of bacteria in a sample of water are subject to very considerable question, and that any deductions or criticisms which they may base upon such statements are of less value than if they had been founded upon a more generally accepted bacteriological technique. The method of Donald is thus preferable to that of culture in that it eliminates the differences due to cultural technique and gives an exact reading of all bacteria living or dead in a very short time.

[13] Proceedings of the Royal Society, Series B, vol. lxxxvi., 1913, p. 198.

A CASE OF FACIO-HYPOGLOSSAL ANASTOMOSIS.

BY EDMUND C. BEVERS, M.A., M.B., B.CH. OXON., F.R.C.S. ENG. & EDIN.,
ASSISTANT SURGEON, RADCLIFFE INFIRMARY, OXFORD.

THE patient, a girl aged 14, was admitted to the Radcliffe Infirmary, Oxford, in April, 1910, suffering from acute suppuration in the middle ear. A radical mastoid operation was performed, and this was followed by paralysis of the right side of the face. The paralysis was complete and immediate after the operation. At the end of a fortnight the facial muscles were tested, and the complete reaction of degeneration was found to be present. A period of two months was now allowed to elapse, at the end of which time the wound in the mastoid had healed. This is a necessary precaution, for it would be unwise to undertake a deep dissection of the neck in the presence of a septic condition of the ear; primary union is essential to a satisfactory result in these cases.

Operation.—An incision 3 inches long was made from behind the lobule of the ear downwards along the anterior border of the sternomastoid; this muscle was defined and drawn backwards and the posterior belly of the digastric identified. The facial nerve was now sought for in front of the styloid process, and this was the most troublesome part of the operation, each piece of fibrous and gland tissue having to be carefully teased through to avoid the risk of accidental division of the nerve. An attempt was then made to pull the nerve out of the stylomastoid foramen, but this failing a small tenotomy knife was pushed up into the foramen and the nerve divided as high up as possible. The internal jugular vein was now retracted inwards, and the hypoglossal nerve where it could be seen crossing the external carotid pulled upon; this procedure simplified its identification above the posterior belly of the digastric. With a small sharp knife the nerve was now cut half across and a slip ¾ inch long raised up and stitched to the peripheral end of the facial with two fine chromic gut sutures; there was no tension.

The wound healed by primary union, and the patient's facial muscles were stimulated during the three weeks she

FIG. 1.

From a photograph showing the face before operation.

remained in hospital by the constant current and by massage; she then left to be treated at the institution where she lived. I did not see her again for six months. Her face was then symmetrical, but she had no power over the muscles on the right side of her face; the electrical reactions present were those of incomplete division; there

FIG. 2.

From a photograph showing the symmetry of the face 15 months after operation.

was some wasting of the right side of the tongue and deviation of that organ to the right.

I saw the patient again at an interval of nine months—that is, 15 months from the operation; there was then return of power to all the muscles on the right side of the face, most marked about the angle of the mouth. She could lift both sides of the upper lip equally well and whistle, but could not quite close the right eye; all the muscles reacted strongly to the faradic current. There were slight movements of the tongue associated with those of the face, and deviation of the tongue to the right. During repose the face was symmetrical; when smiling some return of emotional movement could be observed. Three months later the patient could quite close the right eye, and the movements of the tongue were not associated with those of the face. There was marked advancement in the patient's power of emotional movement. This improvement continued steadily until she left England 21 months after the operation. Although this case cannot yet be regarded as a complete cure, progress has been so steady and continuous that there is good reason for believing that the face will eventually be restored to a normal condition.

The operation of anastomosing the peripheral end of the facial to the central end of another cranial nerve was first performed in 1879; but the modern operation is due to C. A. Ballance, who first carried it out in 1895, and in 1903, together with Purves Stewart and H. A. Ballance of Norwich, published the results of six cases.[1] Ballance in his first five cases made the anastomosis with the spinal accessory. The result of these operations seems to have been that, although the face was more or less normal in repose, for a time at any rate voluntary movements of the face were associated with those of the shoulder, subsequent improvement depending on the power of the individual to educate anew part of the shoulder centre at the junction of the upper and middle thirds of the ascending frontal gyrus to do the work of the old facial centre some distance away in the lower third of the same gyrus.

To obviate these difficulties Ballance in his sixth case anastomosed with the hypoglossal instead. Here, again, there were associated movements of the tongue with the face, but in the first place the tongue cannot be seen, and in

[1] Brit. Med. Jour., vol. i., 1903, p. 1009.

the second place these associated movements of the tongue in some cases (as my own) soon disappear. The cortical centres of the tongue and face are close together and even overlap, and there is an association between facial and hypoglossal centres in the bulb—in fact, the orbicularis oris and the transverse fibres of the tongue always contract together, and it is believed that the facial nerve derives its lip fibres from the hypoglossal. Ballance in a paper in 1909 condemns end-to-side anastomosis and advises complete division of the hypoglossal, anastomosing its central end to the facial and its peripheral end to a slip of the spinal accessory.

Oxford.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SPECIAL MEETING OF FELLOWS.

Completed Discussion on Alimentary Toxæmia.[1]

Professor H. J. HUTCHENS expressed his hesitation in reopening the discussion, as he was only able to speak from the bacteriological point of view, and the points which it had occurred to him to mention had already been efficiently introduced into the discussion. The question of the influence of bacteria on animal nutrition was originally raised by Pasteur, after Duclaux's experiments on the part played by bacteria in the life of plants. The experiments designed to determine whether it was possible for life to be maintained in the higher animals in the absence of micro-organisms cannot be said to have led to a conclusive result. Two opposing schools of thought arose out of the experiments, one of which held that the bacteria of the intestinal flora performed a doubly useful function—namely, that of nutrition and protection against invasion of the body by pathogenic species. This aspect of the problem seems to have received very little if any attention. The other view, which practically holds the field to-day and which is very strongly urged by the French school of bacteriology led by Metchnikoff, maintains that the bacteria of the alimentary canal are altogether harmful in that from the débris of the food-stuffs after digestion is completed bacteria elaborate certain chemical substances which it is assumed are responsible for the sclerotic changes in the tissues characteristic of old age. It has, however, yet to be shown, firstly, that bacteria are in the main responsible for the formation of the chemical substances supposed to be noxious; and, secondly, that these compounds—indol, skatol, cresols, phenols, &c.—are the real cause of the changes in the tissues attributed to them. But over and above the non-specific products which bacteria may produce in the alimentary canal it is at least conceivable that the specific products—the true toxins—of the intestinal flora may be harmful, and in this connexion the striking frequency of the presence of the colon bacillus in pure culture in the urine in cases of intestinal stasis, and that without any symptoms of cystitis, would appear to be of some signification.

Dr. E. VON OFENHEIM said that he would confine himself to a short preliminary report on some recent experiments which, although not yet published, might possibly by-and-by alter the views as to the causation of toxic absorption which were held at the present moment. The facts which Mr. Lane had so clearly shown, and which formed the well-defined picture of intestinal stasis and toxic absorption, were in his opinion beyond all discussion; but what was still open to argument and controversy were the deductions and conclusions which were drawn from these facts as to their causation, their consequence, and treatment. Amongst other arguments it was put forward in this discussion that the bacteria and not the stasis were the cause of toxæmia. Surely no one had ever contradicted this nor pretended anything else; but the question was, What was the effect of the stasis on the bacteria, and *vice versâ*, the effect of the bacterial toxins on the stasis? That between them existed a vicious circle had repeatedly been proved, and he referred to it himself more extensively in a previous discussion. Stasis caused bacterial poisons to be formed—these poisons, again, had a paralysing effect on the intestines, and in this way added to the stasis. Biologically speaking, the internal absorbing surface of the intestine, the villi, corresponded, as Schotellius had shown, to the roots of a plant. That they were placed in the animal body on the inside of its external tegument, whilst in the plant they were externally situated, was only in accordance with the tendency of the animal body to enclose the greatest possible surface development into the smallest compass, whilst in vegetable life, which was chiefly based on a deoxidising process, the widest possible external surface development was of vital importance. If a plant was left for a long time in a flowerpot and was prevented from getting fresh earth and from getting contaminated with other organisms this plant would, after a time, sicken and die, and even if one added to the soil fresh but sterilised earth it would make no difference to the recovery of the plant; but if one added fresh earth which was not sterilised and contained bacteria, or added these bacteria separately, the plant would recover and prosper. Another experience: every bacteriologist knew that bacteria which had grown for a long time in the same medium changed their appearance and underwent what was technically termed "involution," and after some time died off altogether, even if fresh broth, or whatever the medium was, was added to the old one. To keep organisms alive it was therefore essential to transplant them from time to time (the time varying, of course, according to the kind of organism). These two observations had to be mentioned first to explain the facts which he was going to put before them. It was remarkable that the majority of the investigations in the intestinal flora of the constipated was carried out with the view and in the hope of finding some special species of microbes causing the symptoms of intoxication. Metchnikoff carried his researches on on those lines, and was induced to try to increase the number of what he considered the "beneficial" organisms by administrating certain strains of particularly resistant lactic acid organisms. What, of course, was overlooked was that it was an easy matter to introduce organisms into the intestines, but that it was by no means easy to acclimatise them and make them grow under circumstances which were unfavourable for their species. Other bacteriologists again blamed an overwhelming amount of organisms for the pathological symptoms, and suggested reducing their amount by disinfectants and cleansing measures which were applied to the first part of the digestive tract, i.e., the mouth, as if any amount of cleaning and disinfecting were able to reduce bacteria in a cavity of the living body at all. Comparing the intestinal bacterial flora of a patient who was suffering from stasis with that of a healthy person the striking difference between the two was not a *larger* amount of bacteria in the constipated but a *smaller* one. The difference in the species in both cases was a very unimportant one, and sometimes one found an exactly identical bacterial flora in constipated as in healthy individuals. But another feature was most marked, and that was that in the fæces of the constipated one found countless involution forms, polar-staining organisms, and all sorts of mis-shapes which showed that the organisms present were living under conditions which were unfavourable for themselves and which seemed to cause them to undergo such changes as were found in old and overgrown cultures. By cultivating emulsions made from the fæces of constipated persons only about one-fifteenth to one-twentieth of the number of colonies grew compared with those of a normal non-constipated individual. Dr. Distaso had by different methods found the same phenomenon. It seemed that these organisms were undergoing the same changes in the intestinal tract of the constipated as were found in old stale cultures, that was to say, in cultures which had been overloaded with bacterial products by which the organisms themselves had gradually been damaged or killed off. Again, from cultural experiments we knew that all these organisms did not give off their actual toxins at once, but that only after they had been damaged or destroyed, their endotoxins were liberated into the surrounding medium. Only by the destruction of bacteria were those endotoxins liberated which had to be blamed for the toxæmic symptoms. As a matter of fact Dr. Distaso had succeeded lately by some very ingenious experiments in producing a picture

[1] THE LANCET, March 15th (p. 754), April 19th (p. 1093), and 26th (p. 1163), and May 3rd (p. 1232), 10th (p. 1310), and 17th (p. 1383), 1913.

of constipation—at least, the bacteriological picture, *in vitro*; that was to say, he transformed the bacterial flora of a normal non-constipated individual in his cultures into the flora which occurred in the constipated. Dr. Distaso hoped to publish his most remarkable results before long. As he (Dr. von Ofenheim) did not believe in approaching any subject from a one-sided point of view, he thought that it was essential also in the investigation of toxæmia not to lose sight of the clinical aspect, and to see now far the clinical symptoms were in accordance with or could be explained by the bacteriological findings. A good deal had been written lately on disease carriers, or, in other words, on the possibility that certain persons were carrying pathogenic organisms in their bodies without deriving any harm from them and being able to transmit them to other healthy persons in whom the pathogenic symptoms developed. It was a well-known fact that typhoid, cholera, and dysentery bacteria could pass through the intestinal tract without doing any damage to their host so long as they were not broken up by lysis or autolysis. As a matter of fact, the bacteria found in the fæces of these carriers were always quite typical, and showed no signs of degeneration as they did in those people who actually developed the disease. It was only by the influence of antibodies, chiefly lysins or autolysins produced by the organisms themselves, that their bodies were broken up and their endotoxins set free, so producing the morbid condition. In other words, just in those persons the tissues of whom had receptors for certain organisms the disease would develop; whilst in others who had no such receptors and therefore no influence on the organism would remain healthy in spite of their infection. It might sound paradoxical, but it came to this—that *the presence of immune bodies was the cause of the disease.* If we compared the clinical symptoms of such acute infections as cholera, dysentery, &c., with the chronic condition of auto-intoxication, we must admit that the symptoms were practically identical, and that there was a difference of quantity only and not one of quality. Such were cold clammy extremities, general malaise, sickness, furred tongue, foul breath, pigmentation, and erythemata; and last, but not least, the effects on the central nervous system showing themselves, in the acute forms as delirium and coma, in the chronic as neurotic excitability and undue tiredness. Assuming that their conclusions were correct, therapy would resolve itself not into the question of fighting one or the other species of organisms, but into the problem of either *preventing* the destruction of organisms and their autolysis, or in shortening the time during which the bacteria remained in the intestinal tract. The latter method was the one which had been so admirably adopted by Mr. Lane, and the wonderful successes he had obtained, many of which he (Dr. von Ofenheim) was fortunate enough to have had the opportunity of watching himself, were due to the fact that Mr. Lane shortened the passage of the fæcal matter through the intestinal tract, and particularly that he excluded the inert big intestine which was acting as an incubator and gave the most favourable conditions possible for an overgrowth, and, in consequence, for the autolysis of the bacteria. In spite of the remarkable results obtained by this operation it was scarcely a method which could be generally employed in all cases, as nowadays practically 90 out of 100 individuals in civilised countries were suffering from intestinal stasis, and it would more or less remain an *ultima ratio* which would have to be reserved for extreme cases. One would therefore have to search for other means by which breaking up of the organisms could be prevented and in this way the deleterious effects of their endotoxins avoided, of which the most important one, perhaps, was increase of the stasis. Experiments were in progress in that direction at the present moment, but it would be too early in the day to speak of them publicly, as no opinion could yet be expressed as to their success or failure. Comparing clinical appearances with the results of bacteriological investigation and the pictures presenting themselves in the post-mortem room, there could not be any doubt that the symptoms found and so ably described by Mr. Lane were due to the absorption of toxins from the intestines, and whatever the treatment of it would be in the future, at the present moment there was no other way of dealing radically with the more severe cases of this sort than by an operation, by which the time during which the organisms remained in the intestine could be shortened.

Dr. FRANCIS BROOK said: Neurasthenia has long been suspected to be due in a majority of cases to a toxic condition of the *blood* originating in an alimentary toxæmia, but hitherto no definite proof of that theory has been brought forward. I venture to think that, on considering the evidence I am about to put before you, you will agree that this theory is no longer mere conjecture, but rests on a solid basis of fact. The usual bacteriological picture presented by a culture plate of nutrose lactose agar, sown with an emulsion of fæces from an average normal healthy individual, shows about 90 per cent. of a mixture of bacillus coli communis and bacillus coli communior in about equal numbers, together with about 10 per cent. of a saprophytic streptococcus brevis. 132 cases of neurasthenia in all were investigated, and the bacterioscopic examination gave the following results: Bacillus coli, 27 cases; streptococcus pyogenes longus in practically pure culture, 62 cases; coliform bacilli in practically pure culture, 25 cases (this coliform bacillus, probably an atypical strain of B. coli, produces blue colonies on nutrose-agar plates); bacillus lactis aerogenes in more or less pure culture, 7 cases; mixed infection, 11 cases. Serological observations (agglutination reaction and opsonin estimation) were made in all the cases, except some of the streptococcal ones, and formed a most valuable guide. In a large number of streptococcal cases pyorrhœa either was or had been present. I think it will be agreed that the above analysis also throws much light on the well-recognised connexion of neurasthenia with colitis, a fact which has long been admitted, and also with various forms of chronic arthritis and neuritis. Upon the bacteriological results my cases may be classified as follows: Class 1. Those in which the bacteriological flora appeared normal, and where subsequent investigation by serological methods was needed in order to select such strains of B. coli as had undoubtedly acquired pathogenic properties. Class 2. Those in which the bacillus coli normally present had partially or wholly disappeared from the intestinal flora and was replaced by (*a*) streptococcus pyogenes longus, (*b*) coliform bacillus, and (*c*) bacillus lactis aerogenes. Autogenous vaccines were given in all cases; sour milk, intestinal antiseptics, high colon lavage, and special diet were at times prescribed. Successful results were obtained in the majority of the cases and in many where previous treatment by other methods had completely failed. The improvement, both physical and mental, always coincided with the disappearance of the abnormal flora from the intestinal canal, and the cases which were not cured were those where nothing that one could do caused a return of the normal flora. These cases were almost invariably streptococcal in type. The treatment occupies in most cases about three months, the majority of them getting well in that time. The rapidity of the improvement in some cases is such as to be almost startling. With regard to the permanence of the cure, some of the cases have been under observation over two years, and they remain perfectly well to-day. One of the most striking results was the rapid improvement in the physical appearance; the pallor, muddy complexion, dark circles under the eyes, and blueness of the lips so often present rapidly gave place to a healthy colour; the eyes became brighter and lost their dull heavy look, and the face lost its appearance of premature age. The indigestion, aching pains, lassitude, and irritability disappeared, and the change in the mental condition was equally marked. The memory and power of concentration improved, the depression and insomnia passed away, and the whole outlook on life became quite changed, and, in fact, normal, and marked increase in weight often occurred. I believe the bacteria referred to bore a direct causal relationship to these cases of neurasthenia, for the following reasons: 1. An abnormal condition of the intestinal flora was present in more than half the cases. 2. Serological tests yielded evidence of infection by the abnormal bacteria, and by some of the strains of colon bacilli in each of those cases where the intestinal flora appeared at first to be normal. 3. Most important, the improvement in the patient's condition, both physical and mental, under treatment synchronised with the reappearance of the normal intestinal saprophytes in the fæces and the disappearance of the abnormal organisms.

Mr. J. F. BRISCOE approached the question from the point of view of prevention, and commented upon the rarity of appendicitis in mental hospitals. So rare was such a condition

that Dr. F. W. Mott, pathologist at Claybury Asylum, said he had not seen one case in 2000 post-mortem examinations. The speaker referred to a debate on the question of appendicitis in asylums which he initiated before the Medico-Psychological Association, in which he pointed out the foregoing, and drew attention to the baleful effects of constipation not only on the bodily but also on the mental condition, tending as it did to irritability, perverted moral feelings, and melancholia. Sometimes a copious motion was followed by a disappearance of the mental illness. Until a thorough dental and intestinal drilling was appreciated and carried out, alimentary toxæmia would continue to be responsible for a number of ailments. He considered that stasis was much less harmful when the food had been thoroughly insalivated before leaving the mouth. In the ten years 1902–11 the English Commissioners in Lunacy recorded only 75 deaths from appendicitis, typhlitis, or perityphlitis, ascertained in most cases by post-mortem examination.

Dr. ROBERT BELL said that he trusted he might be pardoned if he referred to a misstatement which Dr. Saundby had unwittingly made when he said that Bouchard originated the doctrine of autointoxication, a remark which he (Dr. Bell) thought was hardly correct, for by referring to THE LANCET of 1880, vol. i., there would be found an article contributed by him, in which he believed the subject of autointoxication was drawn attention to for the first time in medical literature. When notice was given of this then impending discussion his impression was that it would be chiefly concerned with *auto*toxæmia, and it was upon this branch of the subject only that he proposed to focus his remarks. He observed that Dr. Hale White, in his able address, was inclined to look upon pyorrhœa as a primary form of alimentary toxæmia. From this view of the subject he felt he must differ *in toto*, as his experience of the disease had invariably led him to the conclusion that it was, in every instance, secondary to autotoxæmia, arising, as it did, in subjects whose diet had been at variance with their physiological necessities. One example would be sufficient to illustrate the correctness of his assertion. About two years ago a well-known professional man came to him in great distress in consequence of the fear that his career would be sadly handicapped were he to follow the course which had been mapped out for him with regard to his teeth, of which he had a most perfect set; every one of them, however, was in a precarious condition in consequence of pyorrhœa. This he (Dr. Bell) attributed to a faulty diet, associated with intestinal stasis and consequent autotoxæmia. The diet, therefore, was restricted to what he maintained man was intended to confine himself to, if he wished to obey those laws which were in conformity with his anatomical and physiological structure—viz., cereals, fruits and vegetables, eggs, milk, and cheese. The result in this interesting and anxious case was that in eight weeks the pyorrhœa had completely disappeared, and coincidently all apprehension regarding the safety of the teeth. He therefore thought we were beginning at the wrong end when we looked upon pyorrhœa as a primary cause of autointoxication, and in this contention he was supported by a friend who had also had considerable experience in similar cases. Dr. White had stated that "some individuals are perfectly well if the bowels are only opened once a week." This was certainly quite opposed to his ascertained facts on the subject, nor could he conceive that two such opposing sets of circumstances could possibly coexist. The limit of time that should elapse between the eating of a meal and its passage through the intestines should not exceed 18 to 24 hours if a person was to retain his resisting power over disease: every hour which was in excess of this was bound to interfere *pro rata* with the health of the individual and his or her resisting power to disease. There were some people, however, who could accommodate themselves to, and appear to be happy in, any amount of filth, but because they seemed to get on apparently fairly well in the circumstances which custom had habituated them to it would invariably be found in the long run that custom did not insure immunity. The fact was undeniable that a sanitary condition of the colon was essential to healthy physiological activity. It seemed to him a little short-sighted to occupy so much time in endeavouring to name and classify the various bacteria which invaded the intestinal canal, for, after all, they were very protean in their character, their appearance and potency, either for good or evil, depending largely upon their pabulum and environment. It was essential, therefore, that the diet should be so arranged as to encourage only the innocent and not the malevolent forms of these useful or pernicious organisms, seeing the form they assumed depended so much upon the soil upon which they were cultivated. Moreover, the resulting products of decomposition, for which they were responsible and which we called toxins, without doubt depended entirely upon the nature of the food supplied. It therefore should be one's aim to admit only such articles of diet into one's mouth, so that the unutilised portion, when it found its way into the colon, would give rise to the most innocent form of the products of decomposition. Dr. Bell then advocated wheatmeal bread as a suitable food for human beings, and pointed out the harm done to food by cooking. No animal was so constituted that it was possible for it to derive full benefit from its diet if the vital principle, the nuclein, and the organic salts it contained in its natural condition were destroyed by heat. Baked bread, and it was only whole wheatmeal bread which he thought was fit for human food, might be looked upon as an exception to this rule, but he maintained this even was neither so wholesome nor so nutritious as unfired bread, nor was it so easy of digestion. Not only had various experiments proved, beyond the shadow of a doubt, that those living upon a natural diet were physically more fit than those subsisting upon the conventional diet of the present day, but also that their mental vigour was more favourably influenced. No doubt the secretion of the thyroid gland for a time would tend to keep autotoxæmia in check, but the period arrived when its functional activity, and therefore its inhibitory power, ceased in consequence of the gland itself being rendered incapable of performing its duty, this being due to the toxic condition of its blood-supply. It was then the subjective symptoms which were characteristic of autctoxæmia would become most pronounced In conclusion, he had never come across a case of cancer in which the patient had not been a victim of chronic constipation, and he felt confident that cancer was not the only disease upon which an unsanitary condition of the colon acted as a potent predisposing cause.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

Bacterial Infection of Fœtal Membranes.—Rupture of the Uterus.

A MEETING of this section was held on May 1st, Dr. AMAND ROUTH, the President, being in the chair.

Dr. E. NAPIER BURNETT (Newcastle-on-Tyne) read a short communication on Bacterial Infection of the Fœtal Membranes from a case of Hydrorrhœa Gravidarum. The patient, a primigravida, aged 28, had an abortion occurring in the twenty-third week. Pregnancy had run a normal course until 16 days before the miscarriage, when a discharge of watery fluid occurred, which was followed in two days by a more copious discharge; this continued intermittently, and the fœtal movements were still felt by the patient. During the miscarriage there was practically no liquor amnii, and the afterbirth was discharged spontaneously. On examination of the membranes a thickened yellowish patch about the size of the palm of the hand was noticed, situated upon the pole opposite to the placenta. The puerperium was complicated by an attack of appendicitis, but in other respects was normal; the appendix was removed four weeks later and found to contain about two drachms of purulent fluid. The thickened patch of fœtal membrane was examined by Professor Stuart McDonald. He found the thickening affected chiefly the chorion, which presented nodular bulgings on its decidual aspect; the amnion was only slightly affected. The thickened parts showed leucocytic infiltration and extensive areas of necrosis; in the latter were found isolated areas closely resembling miliary abscesses in appearance. These parts also showed extensive bacterial invasion, but as the membranes had been hardened in preservative fluid, no cultures of these organisms could be made, and consequently their identification was impracticable. Dr. Burnett believed that the fluid discharged was liquor amnii, and further expressed the opinion that the bacteria had probably been lying dormant in the vagina during pregnancy; no vaginal examination had been made

previous to the miscarriage. He further discussed the question whether the bacterial infection of the chorion was the cause of the rupture of the membranes or whether it occurred subsequently. He had been unable to find a parallel case in the literature.

Dr. H. RUSSELL ANDREWS read a short communication on an unusual case of Rupture of the Uterus. The patient was a tripara, and was admitted to the London Hospital 24 hours after labour. She had been attended by a medical practitioner who reported that he had had great difficulty in delivering with forceps and then directly after delivery a pendulous mass came down through the vulva. On admission to the hospital the patient was extremely ill; the swollen, torn cervix protruded through the vulva, and examination under anæsthesia showed the following lesions: (1) incomplete rupture of the perineum with much bruising; (2) vagina completely separated from cervix except for about three inches in front and to the right side; (3) lower uterine segment and cervix separated from the upper uterine segment except on the right side and in front; and (4) lower segment and cervix torn through from top to bottom on the left side. There was a large quantity of blood in the peritoneal cavity. Vaginal hysterectomy was at once performed, some difficulty being met with in separating the bladder, which was ultimately overcome by retroverting the uterus into the vagina and then separating the bladder from above downwards. A large drainage-tube was passed into the peritoneal cavity and the edges of the vaginal wall united to the peritoneum. There was some pyrexia for four and a half weeks after the operation, but ultimately the patient made a good recovery. Dr. Andrews believed the injury had been caused by one blade of the forceps having been applied outside the uterus, and the cervix and lower uterine segments had been pulled away with the head by main force.

SECTION OF OPHTHALMOLOGY.

Exhibition of Cases and Specimen.

A CLINICAL meeting of this section was held on May 7th, Sir ANDERSON CRITCHETT, the President, being in the chair

Mr. N. BISHOP HARMAN showed a case of Exenteration of the Orbit with Partial Excision of the Maxilla and Ethmoid for Rodent Ulcer. The woman had first seen the rodent ulcer 17 years ago, and she treated it herself with caustics. It frequently recurred, and nine years later was as large as a farthing. She then had X rays at every recurrence for four years. Zinc ions were next used, followed by radium for nine months. When sent to Mr. Harman for operation the ulcer was as large as a penny and was fixed to the bone. Ultimately, an extensive operation had to be performed, for the growth was found to have extended into the orbit and the bony walls. None of the newer measures for the treatment of rodent ulcer, Mr. Harman declared, could compare with the knife for certainty and security, and the knife was infinitely less costly than any other method. Had this growth been excised in the first instance the woman would have escaped the necessity for this severe operation, and would have preserved to herself two sound eyes.

Mr. HARMAN also showed drawings of a case of Extreme Hyperphoria, for which he had operated by his new method of subconjunctival reefing. The patient, a woman aged 28, had been a martyr to severe headaches since school days, and could obtain no relief from them. Examination of the eyes revealed hyperphoria, or latent vertical squint, requiring a 15° prism to correct. It was impracticable to wear such a high degree prism. Concluding from other signs in the case that the left superior rectus was at fault, he operated, shortening that tendon by his new method. The patient had now orthophoria to every test, and the headaches had completely ceased. Seven months had elapsed since the operation, and the result was perfect in every way.

Mr. EDGAR CHATTERTON showed a case of Tubercular Iritis in both eyes. The boy noticed that his sight was bad when at school 13 months ago. He had never had pain, and there was no history of tubercle or syphilis. Two months ago he had yellow vascular nodules in both irides, at the angle of the anterior chamber, posterior synechiæ, keratitis punctata, and vitreous opacities. He was now having tuberculin injections, 1/1000th mg. once a week, and frequent tappings of the aqueous. The condition had improved on that treatment.

Mr. SYDNEY STEPHENSON showed a case of Ocular Torticollis in a boy aged 13½. At 3 months of age, when recovering from whooping-cough, he held his head towards the left shoulder, and that habit had persisted. While he was in the wry-neck posture there was no squint or diplopia, but when he straightened his head the right eye turned upwards and outwards, and vertical and contortional diplopia developed.

Mr. G. H. POOLEY and Mr. HAROLD B. GRIMSDALE showed cases of Angioma of the Retina, and Mr. Pooley also exhibited a case of Giant-celled Sarcoma, in which there had been several operations for recurrences, the last in November, 1911, since which there had been no further appearance of the disease.—The PRESIDENT commented on the present procedures as a great advance on the days of removal followed by the application of caustic zinc paste to the remaining surface of the wound.

Mr. H. HERBERT showed a case of Third Nerve Paralysis with Rhythmic Clonic Spasm. In this case no divergence was to be seen, but there was the same absence of strabismus as in congenital paralysis of the sixth nerve. The synchronous raising of the lid to the normal extent was due to spasm of the unstriped levator muscle, which was innervated by the sympathetic.

Mr. J. H. FISHER exhibited a case showing Arteriovenous Communication in the Cavernous Sinus, successfully treated by ligature of the common carotid.—Mr. ELMORE BREWERTON, discussing the case, pointed out the reason why the internal carotid should be tied in preference to the common carotid, and said he thought that measure would be followed by more cures and less cerebral complications.

Mr. ERNEST CLARKE presented a case showing an unusual arrangement of Opaque Nerve Fibres. The patient was a myopic youth aged 20. There was a peculiar ring round the disc, bulging forward, giving to the disc a crater-like appearance. Opaque nerve fibres spread from all parts, and partly involved the macula.

Mr. R. R. CRUISE showed three instances of Trephining combined with insertion of thread in glaucoma, the object of this being to increase the area after trephining. The aqueous filtered along the course of the thread and did not cause inconvenience. He explained that the procedure was on its trial.—The PRESIDENT said that he sent one of the cases shown to Mr. Cruise for treatment, expecting that enucleation would have to be performed, but from a tension of D3 the tension was now found to be normal or even subnormal, and the pain had gone.

Mr. F. RICHARDSON CROSS (Bristol) showed a Pigmented Growth of the Conjunctiva. The general impression was that free excision followed by the galvano-cautery to the residue should be done.

SECTION OF ELECTRO-THERAPEUTICS.

Exhibition of Cases, &c.—Substitute for Induction Coil.

A MEETING of this section was held on May 16th, Dr. REGINALD MORTON, the President, being in the chair.

Mr. S. GILBERT SCOTT showed a case of Multiple Recurrent Nodules after Removal of Breast Carcinoma, in whom cure resulted after a considerable amount of X ray treatment. This latter was commenced in February last year and was carried out twice a week for twenty-five sittings, but the number of nodules increased, she became greatly emaciated and was very ill, with laboured respiration, probably due to the pressure of a nodule or enlarged gland on the root of the lung. The prognosis was regarded as hopeless. But in February of this year the nodules began to decrease, her breathing was easier, and she was able to resume the taking of solid food. She was now apparently well and looked well, but as the improvement set in four months after the discontinuance of the treatment he hesitated to attribute it directly to the rays, and was inclined to regard it rather as an instance of spontaneous cure, such as one heard of but seldom had an opportunity of seeing.—Mr. W. DEANE BUTCHER thought the case could legitimately be claimed as one of cure by X rays. Late sequelæ of an unfortunate character were generally attributed to the rays, and it was only reasonable that this should also be done when the sequel was a good one.—Mr. C. R. C. LYSTER agreed with Mr. Deane Butcher, but called to mind cases of spontaneous cure of cancer before X ray days, and counselled an open mind on the subject.—

Dr. FRANK FOWLER thought the case illustrated the importance of using X rays as a prophylactic against recurrence after removal of a cancer focus.

Dr. E. P. CUMBERBATCH showed a girl, aged about 12, who five years ago began to have enlargement of glands on both sides of the neck, which later suppurated, and sinuses formed. Treatment by fomentations, unguents, &c., having only indifferent results, X rays were commenced in May, 1911, and improvement set in from that time, and the patient was now quite well and robust.—Dr. NORMAN E. ALDRIDGE thought the efficacy of X ray treatment of tuberculous glands ought to be better known, and mentioned some successful cases of his own of similar nature.

Dr. W. N. KINGSBURY exhibited a series of cases of Exophthalmic Goitre which had been successfully treated by means of X rays, the doses in each case having been a half pastille. One of them, a very severe case, had had a dozen doses at three-weekly intervals, and was now well in every respect. The pulse-rate was greatly reduced, from 100 or 130 to 60 or 70 per minute, and the other symptoms decreased correspondingly.

Dr. W. IRONSIDE BRUCE gave an account of 12 cases of Exophthalmic Goitre, dividing the results into three categories: cured, greatly improved, improved. Four were cured, 5 were greatly improved, and 3 were improved. One in each of the last two classes had been operated on, and two in the last series were still undergoing treatment. One should not be too dogmatic as to the effect of the rays in these cases, as the disease had been known to involute spontaneously.—Dr. H. HUMPHRIS spoke of the importance in this treatment of stimulation of the region of the sixth and seventh cervical, electrical irritation of which, apart from application of X rays, had been found very serviceable in America.

Dr. STANLEY MELVILLE demonstrated the usefulness of the metal duralumin for splints on account of there being no shadow cast by it when taking a radiograph. It was barely one-third as heavy as mild steel, but it was as strong as the latter. Caustic alkalies rapidly destroyed the substance, but even strong acids had no effect upon it.

The PRESIDENT showed a working substitute for an induction coil, the latter being admittedly an unscientific instrument for medical treatment and diagnosis, because one seldom knew the exact character of the current given off by any particular coil. To meet this difficulty he made, in 1903, a revolving commutator with an adjustable brush, as suggested by Leduc, but so modified that the current was reversed as well as interrupted, thus getting rid of the accumulation of electrolytic products and increasing the tetanising effect. By means of the shifting brush the length of the alternating impulses could be varied from 0 to 0·5, so that at the maximum each impulse was followed by an equal period of rest before reversal took place. The current from the source of supply passed through the milliampèremeter before reaching the commutator, this giving the mean value of the current passing. The rhythmic interrupter had also greatly enhanced the value of electrical treatment. In one case of arthritis which did not seem to be making much progress under ionisation it occurred to him to pass the current through the rhythmic interrupter, and there was enhanced improvement from the time of change of method; and this had been repeated in other cases. The rhythmic variation should be a very slow one—a complete cycle in not less than six seconds. In the apparatus now shown the requirement was well met. The current, after passing through the meter, was led through terminals to the common points of a double pole two-way switch. The wires led to terminals on the other side of the board to which the patient is connected, one of the wires taking in the rhythmic interrupter on the way. A short-circuiting switch placed the latter out of action when not required. Though driven by the same shaft, the speed of either could be varied independently of the other. The commutator gave two complete cycles per revolution, and a scale and pointer indicated the length of the impulses relatively to the periods of rest. The rhythmic interrupter was driven from the opposite end of the same shaft by means of a friction-wheel acting on the face of a copper disc, the speed varying with the point it engaged between the centre and periphery of the latter.—Dr. G. B. BATTEN spoke of his adaptation of a rectifier at about the same date as Dr. Morton discovered his, the current passing through lamps, and picking out a little of the sine curve.

Mr. C. WARD (Natal) sent photographs and details of a Zulu lad who had recovered from lightning stroke. He was alongside the leading mules of a large team, and these as well as three others were killed by the same stroke. The photographs showed extensive scars on the front and left side of the thorax. He was rendered unconscious at the time, but made a good recovery.

SECTION OF OTOLOGY.

Exhibition of Cases.

A MEETING of this section was held on May 16th, Dr. J. DUNDAS GRANT, the President, being in the chair.

Dr. J. DONELAN showed a case of Persistent Paroxysmal Cough apparently due to irritation of the chorda tympani nerve by a spicule of steel which had penetrated the tympanum. The patient, a man aged 45, visited some engineering works, and a few days later he was seized with violent coughing. These coughing attacks persisted for two years with no apparent provocation. The larynx seemed normal, except for some general hyperæmia, probably caused by the coughing. Dr. Donelan included the ears in his routine examination, and found on the left tympanum a tiny black spot surrounded by a reddish areola, just where the chorda tympani crossed the malleus. Under cocaine a spicule of steel 3 mm. long was extracted. This was followed by violent coughing, but there had been no further trouble.

Mr. J. F. O'MALLEY showed a Congenital Syphilitic, aged 10 years, whose bilateral deafness of a year's duration was cured by three monthly doses of 0·3 grm. of neo-salvarsan intravenously.

The PRESIDENT showed a patient the subject of Chronic Attic Suppuration on whom he so operated as to retain the ossicles and the remains of the membrane. The patient was a woman aged 23, and she had had for ten years discharge from the left ear, which was found to be issuing from the attic. She had preserved acute hearing. The operation shut off the diseased cavity from the Eustachian tube and naso-pharynx, and healing ensued quickly.

Dr. H. J. DAVIS showed a man, aged 70, from whose Helix an Epithelioma had been removed by taking away the pinna, without operation on the glands, as they appeared not to be involved.—Several similar cases were mentioned by members in which, when cervical and pre-auricular glands were not removed at the time, there was recurrence of the disease.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

Bitemporal Hemiopia.—Congenital Defect of the Abdominal Muscles, with Anomaly of the Urinary Apparatus.

A MEETING of this society was held on May 7th, Mr. J. M. COTTERILL, the President, being in the chair.

Dr. H. M. TRAQUAIR communicated a paper entitled "A Contribution to the Study of Bitemporal Hemiopia." He said that two chief types of this hemiopia occurred. In one, the scotomatous type, which was characterised by early loss of direct vision, a scotoma appeared in the central part of the temporal field together with some peripheral contraction which usually commenced in the upper outer quadrant. By a combined development of both defects, the temporal field became lost. In the other or non-scotomatous type, peripheral contraction alone occurred, and direct vision might remain good for a long time. It was desirable to distinguish these two types, and to ascertain whether and to what extent each had a special clinical significance. In order to demonstrate the presence of hemiopia and its nature a series of test objects of different sizes, both white and coloured, must be used, and the central part of the field within the 30° circle must be carefully examined by Bjerrum's method. It was essential that the size of the test object should be stated, and this was most conveniently done by using its diameter in millimetres as the numerator of a fraction, the denominator of which was the radius of the perimeter or distance of the patient from Bjerrum's screen. In the cases shown, the sizes varied from 1/2000 to 40/300, blue, red, and green being

used in addition to white. A lantern demonstration of the fields in six cases was given. The details of two cases were given as follows :—

CASE 1.—April 5th, 1912. A woman, aged 31, who complained of bad sight as the first symptom. Later her hand and feet became swollen. At present she had obvious acromegaly, though not to an extreme degree. R.V. = 6/60, optic disc pale; L.V. = 6/12, disc normal. Pupil reaction showed some failure of light conduction on right side. Sella turcica shown by X rays distinctly enlarged. Fields show: Right—practically no change for 5 or 1 mm. white objects except a slight indentation of upper outer quadrant for 1/300 and a large scotoma extending from the fixation point to the blind spot and having a vertical mesial border dividing the fixation point. For red 20 mm. the field was split practically into a normal nasal hemiopic area, with a vertically oblong island in the outer temporal field, mainly in the lower outer quadrant; red 10 mm. gave nasal hemiopic field only. Left—normal fields for white 5/300 and 1/300 except a slightly enlarged blind spot for 1/300. For red, the same as on the right side. There was therefore partial hemiachromatopsia for 20/300 red and complete for 10/300 red. On April 9th a test with blue 10/300 showed a scotoma similar to that in the right eye, but less intense. The patient remained under observation until July 12th, during which the visual defects steadily increased. In the right eye vision fell to 3/60, remaining at 6/12 in the left. The development of the visual loss was watched carefully. Pituitrin was given without producing benefit. On August 18th she stated that the headache was very severe and that she had completely lost the sight of the right eye, which at one time was turned outwards. On examination R.V. = hand movements close, optic disc pale, field unchartable, but a large white object was dimly seen at the periphery but not in the centre. L.V. = 5/10, disc normal. Field showed temporal hemiopia with some vision remaining in lower outer quadrant, while the scotoma was now extending into the nasal field at the fixation point, but for colour only. Large test objects were now required to demonstrate this field. Paralysis of left external rectus present. The patient was very ill and hardly able to get up. On Nov. 13th she looked and felt very well; no muscle paralysis present. R.V. = counting fingers at 1 metre. Field showed absolute blindness of the nasal side, with some retention of vision on the temporal side, especially below. Parts of the scotomatous area formerly blind for months showed recovery. In the left eye vision had risen to 6/6 and there was an upper outer loss for white and colour, but the scotoma had disappeared. Bjerrum's screen showed complete hemiopia for colours and partial for white. On April 26th, 1913, further improvement was noted. Right eye: Further recovery of central area. Left eye: V = 6/6, fields for white practically normal. No headache and patient felt well.

CASE 2.—A woman, aged 36, apparently healthy, complained of dimness of sight after a severe headache. She was subject to "bilious attacks." On August 6th, 1912, R.V. = 6/36; L.V. = 6/24; optic discs normal; bilateral horizontally oval scotomata between blind and fixation spots with failure of upper outer quadrant of field on each side. On August 9th there was relative bitemporal hemiopia with scotomata as before. R.V. = fingers at 3 metres; L.V. = 6/60. Dr. J. S. Fraser found pus in the right maxillary antrum with pus between the septum nasi and right middle turbinated bone. The antrum was washed out. Next day the scotoma in the right eye was much smaller and the field somewhat enlarged. The fields were examined almost daily until August 12th. An X ray examination proved negative. Exploration of the sphenoidal sinuses was refused and the patient went home. She returned, much improved, on August 24th, and since then has become steadily better, vision being 6/9 in February, 1913. Partial optic atrophy was first noticed in September, 1912. Relative bitemporal hemiopia with a small scotoma in the right eye only was still demonstrable by Bjerrum's method.

Continuing, Dr. Traquair observed that the chief point of interest in the first case was the rapid change from blindness of one eye with temporal hemiopia of the other, a not uncommon condition, to full vision in the latter eye, with nasal hemiopia in the former. That the condition was really a form of bitemporal hemiopia was shown by the presence of partial temporal hemiachromatopsia in the better eye. The explanation suggested was that the chiasma had become pushed against the right carotid artery on account of an expansion of the tumour at the time of, and accountable for, the severe illness of the patient. The improvement might be ascribed to the disappearance of the congestion and œdema around the chiasma subsequent to the displaced structures mutually accommodating themselves to some extent. In the second case the fields were of the same type, though the etiology was very different. The changes were rapid and extreme, and recovery was spontaneous. In both cases the hemiopia developed in the same way, as follows. The scotomatous area breaks through to the periphery, which comes in to meet it, firstly in the upper outer quadrant next the mesial line, then in the same position in the lower outer quadrant, splitting the field vertically and forming a temporal island which, in turn, diminishes from above downwards. At the same time the lower nasal quadrant begins to fail first at its mesial border, and the scotoma also crosses into the nasal field below the fixation point. The development of the defect in the lower nasal quadrant may be manifest before the temporal island has entirely disappeared. The process goes on symmetrically in the two fields, clockwise in the right, counterclockwise in the left. The central area behaves like a small field within the field and corresponds to the apices of the four quadrants which become progressively defective in the same order. In this way what may be called the chiasmal scotoma may be distinguished from that of tobacco amblyopia and from other scotomata which might offer a superficial resemblance. Other interesting features common to both cases were the retention of normal or almost normal boundaries for white 5/300 in the presence of advanced changes for colour and 1/300 white. This indicated activity of the process. The great recuperative power of severely affected areas showed that absolute blindness of an area, even lasting for months, was no indication of real destruction of the nerve fibres. The peculiar distribution and sequence of the defects was difficult of explanation and might possibly be of use in future in helping to solve the anatomical and pathological problems of the subject. The general course of the two cases and the points referred to above suggested that neither direct pressure nor traction, but probably œdema and vascular congestion of the structures immediately in relation to the under surface of the chiasma determined the presence of the scotoma. The literature of bitemporal hemiopia and of pituitary disorders afforded considerable support to this view, which was suggested by Fuchs in 1895. The scotomatous type of bitemporal hemiopia therefore indicated activity of the lesion, and where this was a tumour, it indicated a relatively actively growing form and thus made the prognosis somewhat worse. It was not suggested that pressure had no influence, but that it was not the only or even the main cause of this type of field. Charts of four cases of the non-scotomatous type were demonstrated. All were acromegalics with good vision. Three showed enlargement of the sella turcica; the other had not been examined. The main point brought out was that ordinary perimetric examination, even with small white and coloured objects, might fail to show hemiopia, which was found to some degree in all by Bjerrum's method. The changes varied from depression of the upper outer quadrant to nearly complete relative hemiopia. Disproportionate contraction of the colour fields was absent, showing a stationary or slowly moving lesion. Present statistics, which showed only 50 per cent. of field changes in acromegaly, would be greatly altered if more exact examination of the fields was habitually made, especially by the use of Bjerrum's method, and the number of cases reported in which enlargement of the sella turcica was associated with normal fields would markedly diminish. By the same means the number of scotomatous fields would greatly increase, and in all cases in which central vision was definitely reduced, even though not greatly, an explanation should be sought in this direction. Little was known as to the exact nature of the lesion of the nerve fibres which produced the scotoma. Clinically the condition was similar to what was known as retrobulbar neuritis, and might be considered a chiasmal retrobulbar neuritis. The indications pointed to some toxic influence dependent on vascular or lymphatic congestion.—Dr. W. G. SYM, Dr. J. V. PATERSON, Dr. A. H. H. SINCLAIR, Dr. J. S. FRASER, and Dr. J. EASON took part in the discussion which followed.

Dr. LEWIS THATCHER read a paper on a Congenital Defect of the Abdominal Muscles with Anomaly of the Urinary Apparatus, and gave a lantern demonstration. The case was that of a boy aged 3 weeks, who was sent to the Edinburgh Royal Hospital for Sick Children for advice about the abdomen, which had been noticed to have been flat and flaccid since birth. He was well otherwise and had thriven satisfactorily. The front of the chest had been noticed to be flat at birth, but it had, within a few days, assumed its normal prominence. Nothing abnormal had been noted by the mother as regarded the functions of the bladder and rectum. The baby was fairly well developed; the nose broad and flat, with slight asymmetry of the pinnæ of the ears. The thorax was short and wide below, the anterior wall being markedly prow-shaped. The appearance of the abdomen was very striking, the wall being slack and baggy, plastered down on the organs and bulging over the flanks. This redundancy of the anterior abdominal wall showed itself in transverse creasings when the child was set up. Permanent longitudinal furrows which could not be completely smoothed out ran down the abdominal wall, and the umbilicus was represented in the bottom of one of the longest and deepest of these furrows in the middle line. There was no resistance in the abdominal wall whatever, even when the baby cried, and the outline of the various

abdominal organs was very evident. The bladder when full showed as an abdominal organ reaching almost to the umbilicus and of about the size of a hen's egg. When empty it was felt as a spindle-shaped body lying more deeply in the middle line, and in both states was very firm. A small cyst-like mass was palpable, lying in front of the bladder and superficial to it. Both testicles were undescended. There was slight congenital dislocation of both hips on to the dorsum ilii. The child throve well and gained weight at the rate of 1 ounce a day. On several occasions he passed urine without any apparent pain or difficulty; the stream looked of about usual size, and the amount did not seem excessive. When two months old he died somewhat suddenly with symptoms of bronchopneumonia. The post-mortem examination made on the next day showed the following conditions to be present:—Complete absence of the transverse and oblique abdominal muscles except just below the costal margin and posteriorly. Great hypertrophic dilatation of the urinary bladder with no organic obstruction to the urinary flow. The urethral and ureteral orifices were not dilated, the latter being very narrow. Sections of the bladder wall, which was about ⅜ inch thick, showed much fibrous degeneration, especially of the submucous coat. The urachus was about half an inch long only, and took the form of a longitudinal band of fibrous tissue. Below this the cyst palpated during life was found developed in a separate band about an inch long connecting the anterior abdominal wall to the anterior wall of the bladder. Both ureters showed great dilatation and tortuosity, resembling very much, both in size and general appearance, the small intestine which lay over them. The intramural portion of their course was very narrow, but they were patent throughout. Double hydronephrosis was present, but no sign of either recent or old peritonitis. This case illustrated typically a group of malformations, of which 10 other certain cases have been collected from literature. Four of the cases when last seen were over the age of two years, which at once showed that certain grades of the condition were compatible with life (the eldest was 17 years of age). All the cases occurred in males. The prow-shaped deformity of the thorax could be accounted for by the absence of the usual mooring-down influence of the abdominal muscular wall; the thorax was flat at birth and only became deformed with the onset of respiratory movements. The appearance of the abdomen was at once very suggestive of great previous stretching. The permanent longitudinal furrows, with the abnormality of the umbilicus, could be accounted for by this also. The deeper layers of the skin were ruptured by this great increase in intra-abdominal tension during some period of fœtal life. When the bladder began to contract downwards, the downward pull would naturally throw the abdominal wall into folds, which would tend to fall along the lines of weakness. After discussing the various theories which have been given to account for congenital hypertrophic dilatation of the bladder, with dilatation of the ureters and hydronephrosis, where there was no organic obstruction found, the possible reasons for the muscular defect in addition were gone into. It was thought that the muscular maldevelopment was secondary to the enormous size of the bladder for the following reasons: the appearance of the abdomen was at once very suggestive of previous great distension. Nothing had been found to account for this except the enormously hypertrophied bladder, which had also expanded to the utmost of its limits up to the anterior abdominal wall. It was evident from the extent of their connexions that the anterior abdominal wall and the anterior wall of the bladder had been at one time in very intimate contact. The area over which the muscles were absent was roughly one which would be subjected to direct pressure by a tumour in the lower part of the abdomen and anchored to the umbilicus. Elsewhere they were comparatively well developed. It was therefore probable that the muscles were prevented from growing forward in the usual way, for it had been shown that there was not an atrophy but a complete lack of development of the muscular tissue. There was no other instance known of symmetrical absence of parts of several pairs of muscles. Moreover, there was a possible parallel to this maldevelopment from pressure in those cases of congenital unilateral pectoral defect.

HARVEIAN SOCIETY OF LONDON.—A clinical meeting of this society was held on May 8th, Dr. Leonard G. Guthrie being in the chair. The following cases were shown:—Mr. E. Laming Evans: Two cases of Congenital Dislocation of the Hip, one of which was untreated and showed a very marked limp. In the other case he had replaced the head of the bone two years previously and complete functional use of the limb had been recovered.—Dr. S. H. Hay: A case of Friedreich's Ataxia in a boy. Another member of the family had no knee-jerks.—Dr. H. Patterson: A case of Bronchiectasis in a child aged 5, the symptoms having been present for at least two years. The treatment of the case gave rise to a considerable amount of discussion.—Dr. J. A. Torrens: A boy suffering from Splenomegaly.—Dr. W. H. Willcox: 1. A woman who had had a raised temperature for about a year, with signs of Endocarditis. No treatment proved of any avail until a virulent rheumatic vaccine had been injected. 2. A man with Fibrosis of the Left Lung; some fluid had been found by means of the X rays, although the physical signs all pointed to the complete absence of fluid.—Dr. G. de B. Turtle: A case of Marked Separation of the Lower Epiphysis of the Humerus with complete recovery.—Mr. Duncan C. L. Fitzwilliams: A case with a Swelling at the Root of the Neck, the diagnosis lying between a hernia of the lung, a lymphangioma, or a blood cyst. Opinion was fairly evenly divided between the first two.

Reviews and Notices of Books.

Eléments de Sémiologie et Clinique Mentales. Par le Docteur P. CHASLIN, Médecin de la Salpêtrière. Paris: Asselin et Houzeau. 1912. Pp. 956. Price 18 francs.

PSYCHIATRY differs strikingly from other branches of medicine as they exist to-day, in that its data are still in a very large measure drawn solely from clinical observation. For this reason a text-book of the subject must of necessity be written from a somewhat special standpoint; not only must it deal with purely clinical facts, but it must also present, or strive to present, these facts in a different manner from that which is usually employed nowadays in clinical treatises dealing with other categories of disease. For in the study of insanity we still know so little of the morbid conditions which underlie its symptoms, and we are still so powerless to grasp the mechanism by which these symptoms come about, that it is extremely difficult for us to condense and schematise our knowledge on definite and more or less permanent lines, as we can do in other fields of medicine, where the infinite diversity of clinical appearance has been in some sort reduced to relative order and simplicity by our insight into the factors of causation. Consequently, the qualities that we should look for in a treatise on mental disease, at all events in a treatise that aims at being an aid to medical practice, are mainly the qualities of accuracy in the perception and of clearness and graphic power and fulness in the presentation of clinical facts.

These qualities are displayed in ample measure in Dr. Chaslin's useful and well-arranged text-book. The work, which is intended primarily as an introduction to the practical study of insane patients, is written throughout from a strictly clinical standpoint; its style is clear and simple, though by no means disdaining the aid of expressive and what we may describe as visualising metaphors, and it shows a most commendable economy in the use of those cumbrous and ephemeral technical terms which have always been the bane of psychiatry. The bulk of the book—in fact, more than nine-tenths of the whole—is contained in the first two sections, dealing respectively with the symptoms of insanity considered severally, and with the clinical types in which these symptoms are variously grouped. In both sections reference is constantly made to illustrative cases, so that

the contact with clinical reality is never lost, and the views and opinions of the author are always presented to the reader in the form of commentaries on actual cases, and can thus be immediately controlled by comparison with the evidence. The clinical histories are reported in sufficient detail to preserve the individual characteristics of each case as well as its typical features, a method of treatment which enhances very much the value of the book as a guide to the student who is entering on actual clinical work, and which should also make its perusal of interest and profit to the practitioner who desires to refresh his knowledge of mental disease.

Resolute as Dr. Chaslin is to keep on the firm ground of clinical experience and to avoid all excursions into the regions of theory, it is impossible for him, as it must be for anyone writing a book on this subject, to exclude altogether the expression, or at all events the implication, of doctrinal views. Such views must, for instance, enter, and enter very largely, into the system of classification which an author adopts, and no alienist, of course, can be expected to resist the temptation of formulating a scheme of classification. Dr. Chaslin does not profess much enthusiasm for the system which he has devised for his own use, nor does it, in fact, present any superiority over those to be found in other text-books. Its only value is that it helps to define the attitude of the author to the matters which especially interest alienist opinion at the present time. Amongst such matters the doctrines of Kraepelin occupy, of course, a foremost place, and they would appear, indeed, to have exercised more influence and excited more controversy in France than in this country, where they have, nevertheless, most assuredly had a full share of discussion. Dr. Chaslin would seem to be to a certain extent an adherent, though a very unwilling adherent, to the views of the Heidelberg alienist. He accepts, for instance, in essentials Kraepelin's conception of dementia præcox, but changes the label applied to that somewhat vaguely delimited group of cases, substituting the denomination of *folies discordantes*, to emphasise what he regards as the main clinical trait common to them all—viz., the want of harmony between the various symptoms, and particularly between the delirious ideas and the emotional manifestations. As, however, this characteristic is ordinarily an indication of tendency to dementia, the change is of little more than verbal significance. However that may be, the interest and value of the book do not lie in the author's views as to questions of psychiatric doctrine, but in his excellent presentation of clinical facts. In that aspect the work is thoroughly commendable, and is worthy of the traditions of the distinguished school to which Dr. Chaslin belongs.

Clinical Medicine. A Manual for the Use of Students and Junior Practitioners. By JUDSON S. BURY, M.D., F.R.C.P. Lond., Consulting Physician to the Manchester Royal Infirmary. Third edition. Edited by JUDSON S. BURY and ALBERT RAMSBOTTOM, M.D. Vict. Manch., M.R.C.P. Lond., Assistant Physician to the Manchester Royal Infirmary. London: Charles Griffin and Co. 1912. Pp. 530. Price 17*s.* 6*d.*

THE third edition of this well-known manual has been brought thoroughly up to date, and the editors by a careful revision of its pages have rendered the book a reliable guide to the investigation and diagnosis of disease.

The most important of the additions and alterations is a chapter on the examination of the deeper structures by means of the Roentgen rays. This has been written by Dr. A. E. Barclay, medical officer of the X ray department at the Manchester Royal Infirmary. Much useful information is given in this chapter, and the deductions to be made from the results of this method of examination are given with commendable care and judgment. For example, in speaking of the examination of the lungs it is pointed out that the X ray method is only one of the procedures at our disposal; it does not supplant the older methods, but taken in conjunction with them it is a valuable aid. The rays do not distinguish between recent and healed disease, while if the lesion is deeply seated the diagnosis by ordinary methods may be difficult, so that a correct estimate of the actual extent of the disease must be made by checking the radiographic findings by means of the clinical evidence, and *vice versâ*. A similar caution is given with reference to the examination of the heart. The editors point out that the shape and position of the heart vary considerably in the normal subject, not only according to the patient's size and work, but also in the extent to which the organ is affected by the position of the diaphragm; consequently, it is almost impossible to give definite measurements, although many workers claim to have done so. The section dealing with diseases of the skin and its appendages has been revised by Dr. R. B. Wild, whilst Dr. G. E. Loveday has assisted in writing the chapter on the examination of the blood.

The whole work is now very complete and will be found useful by senior students as an aid to their clinical work in the wards and out-patient rooms.

Compendium of Diseases of the Skin. By DUNCAN BULKLEY, A.M., M.D., Physician to the New York Skin and Cancer Hospital, Consulting Physician to the New York Hospital, &c. Fifth edition. New York: Paul Hoeber. 1912. Pp. 286. Price $2 net.

THERE are now quite a number of short manuals on dermatology, but Dr. Bulkley's book, of which the fifth edition, based on an analysis of 30,000 cases, is before us, stands in the first rank for the student and general practitioner. In the preface the author makes clear his aim to help such a public. The first edition, he states, was prepared for practitioners attending his lectures who had no time to study the larger treatises on dermatology. Dr. Bulkley adds that he has avoided entering into abstruse questions and advanced pathology, but has devoted most attention to the subjects of diagnosis and treatment.

A perusal of the text leads to a confirmation of these statements. The lack of illustrations may be considered as somewhat of a drawback. But unless illustrations conform to the modern high standard they are useless, and in a short manual there is not sufficient space to include many first-class plates. The paragraphs on diagnosis are unusual; merely the names of the diseases are mentioned, and the differential points are to be found by consulting the various diseases under their own descriptive heading. The paragraphs on treatment throughout are definite and practical, though condensed. We must dissent from the recommendation to await developments before treating for syphilis in cases where the diagnosis is uncertain. Mention should be made of the various means for detecting the presence of syphilis, and the importance of immediate treatment should be more firmly insisted on. Only where laboratory methods are not procurable can any waiting for the appearance of secondary symptoms be permitted. A very useful therapeutical formulary, containing all the most practical mixtures and local applications, completes the book. Throughout the text this formulary is referred to. More space than usual is devoted to diet. Dr. Bulkley claims great results from certain original dietetic rules which for many years he has consistently urged. There is less frequent recommendation to apply electrical and mechanical methods than we are accustomed to find in modern dermatology. Nowadays, X rays and high-frequency currents are employed even for mild ailments. This book reminds

us that electrical methods cannot be used by every practitioner, nor can they be afforded by the majority of patients.

We congratulate Dr. Bulkley on the clear and interesting method in which he has recorded the conclusions drawn from his extensive experience.

The Conservation of the Child. By ARTHUR HOLMES, Ph.D., Assistant Director of the Psychological Clinic, Assistant Professor of Psychology, University of Pennsylvania. London and Philadelphia: J. B. Lippincott Company. 1912. Pp. 345. Price 4*s.* 6*d.* net.

THE methods described in this book undoubtedly form a most valuable contribution to our knowledge of the best ways of dealing with the feeble-minded child. The author gives a lucid and interesting account of the work carried out in the Psychological Clinic at Philadelphia. This clinic has been open since 1896, and up to the present time has dealt with over 4000 children. Its object is to discover children who present psychological divergences and to find suitable means of training them.

In the first chapter Dr. Holmes gives a most interesting historical sketch of the rise of the movement for dealing with this class of afflicted children. He contrasts the position of these children in early and mediæval times with the advantages of the present, and finally describes the Psychological Clinic. This institution owes its origin to the fact that Dr. Witmer, professor of psychology at Philadelphia, was asked by a teacher to discover, if possible, why a certain child was persistently a bad speller. This was found to be due to the fact that the boy had double vision. The improvement which followed correction of the visual defect led to the establishment of the clinic. The clinic avails itself of every modern expedient of diagnosis which can in any way assist in the detection of any abnormality, and of every educational or therapeutic means which can remedy or improve the defect. The clinic is open to all classes of persons by appointment only, a precaution which is taken to obviate hurried or superficial examinations. An hour is allowed for the first examination of each child.

All the children, as Dr. Holmes repeatedly points out, deviate in some respect and in varying degrees from the normal, or otherwise their condition would not have warranted their being brought to the clinic. The cases can, in the first place, be classed as "mental" or "moral." The next point is to ascertain how far the children of each of these classes are curable or incurable. Many of the children are "retarded," a term applied to those who are two years behind the average age of the children of their "grade" in the school. All cases are first examined by the psychological staff, and it is clear that this examination is conducted upon the most complete and up-to-date lines. Attached to the clinic are classes for the improvement of speech, to which the mentally backward child can be referred if it is judged that this is likely to aid in the cure. A thorough medical examination is also made and all remediable defects treated. It is, of course, well known that mentally backward children frequently become quite normal after the removal of adenoids and tonsils, being in effect really normal children rendered backward by these pathological conditions. But it appears that quite a number of moral deviates have also been greatly improved mentally by the removal of adenoids and tonsils, or by the treatment of other bodily defects. The environment of the child is also carefully considered, and if found to be unsuitable it is either improved or the child is placed in more satisfactory surroundings. Finally, as a result of the examination (prolonged in many cases over a considerable period) it is decided whether the child is to be regarded as a curable or an incurable case. Arrangements are then made in accordance with the finding, and the children are sent to such institutions or homes as may seem to be best adapted to their condition. In giving his description of the clinic Dr. Holmes diverges occasionally to discuss those points concerning which there is either a difference of opinion or of definition among authorities.

It would seem to be difficult to over-estimate the importance of the work done at the Psychological Clinic, and it is to be hoped that the perusal of this book may lead to the establishment of other clinics of this type, especially on this side of the Atlantic, although the work which was initiated under Dr. James Kerr's direction at our London County Council special schools is still developing along lines which seem well adapted to our own requirements.

Human Embryology and Morphology. By ARTHUR KEITH, M.D. Aberd., LL.D., F.R.C.S. Eng., Conservator of the Museum and Hunterian Professor, Royal College of Surgeons of England, &c. Third edition, revised and enlarged. With 422 figures in the text. London: Edward Arnold. 1913. Pp. 475. Price 15*s.* net.

IN this, the third, edition of this work many alterations have been made in the original scheme, and every alteration has been an improvement. The whole arrangement of the subject matter has been changed, and every student will welcome this, for the plan of former editions made consecutive reading somewhat difficult.

The opening chapter is now concerned with a clear and accurate account of the early stages of development of the human ovum; while the subject matter of Chapter I. of the previous editions has rightly been placed further on in the book, as Chapter X. The work, as at present arranged, permits of an ordered and consecutive study of development, for the whole story has been woven into logical sequence. Over 120 new illustrations have been added; the book has been considerably enlarged, and so thoroughly revised and brought up to date that in many respects it bears but little likeness to the two former editions. Most of the slips which occurred in previous issues have been eliminated, but we notice that the mammary condition typical of the monotremes is still said to be the "marsupial" type, although the new text which introduces the subject deals with the condition correctly. We notice also some few misprints, such as "lumber" for "lumbar" in Fig. 410, and the obvious omission of a word on p. 366; but our criticism must be limited to such trivialities.

For the book as a whole we can express nothing but praise and the hope that, with the present inclusion of references to the papers of so many English-speaking workers, and the omission of the B.N.A. terminology, this work will become the standard text-book for the English student.

Traité de Laryngoscopie et de Laryngologie Opératoire et Clinique. Par TH. HÉRYNG. Traduction Française par le Dr. CHARLES SIEMS. Revue et considérablement augmentée par l'Auteur. Avec une Préface du Dr. HENRI LUC. Paris: Masson et Cie. 1912. Pp. xvi.–524. Price 14 francs.

IN writing this book the object of Dr. Theodore Héryng has been not only to bring under the notice of his colleagues his researches into this or that branch of his specialty, but also to publish a digest of his work during 40 years. Therefore one must not look into this work for a systematic description of diseases of the larynx such as is usually given in the text-books required by practitioners and students. It is essentially a book for the specialist. In this, the French, edition some chapters have been revised and others have been added. Amongst these are the chapters on "endopharyngoscopie," laryngostomy, the treatment of tuberculosis of the larynx by the galvano-cautery, the serum

diagnosis of syphilis, and the treatment of syphilis with "606." The volume contains a good deal of matter which will make it a useful work of reference on those diseases of the upper air passages with which the name of Dr. Héryng, of Warsaw, has become associated.

Problems of Life and Reproduction. By Professor MARCUS HARTOG. With illustrations. London: John Murray. 1913. Pp. 362. Price 7*s.* 6*d.* net.

THE text consists of essays which have been published from time to time by the author in various scientific journals, the earliest dating from 1898. Some of them have been rewritten, others have been revised to bring them up to date. The subjects dealt with are Reproduction, Cellular Pedigree and the Problem of Heredity, Brood Formation and Ordinary Cell-division, The New Force, or Mitokinetism, Nuclear Reduction and the Function of Chromatin, Fertilisation, Transmission of Acquired Characters, Mechanism and Life, The Biological Writings of Samuel Butler, Interpolation in Memory, and the Teaching of Nature Study. The author deals with these problems so as to instruct and interest the circle of the "cultured laity," though professed zoologists will also find in the author's lucid expositions and critical surveys much food for thought, as well as a systematic arrangement of facts. He deals first with conjugation, fertilisation, and rejuvenescence. Rejuvenescence is necessary to all beings in some form or other, but the mode adopted varies with the species. It may be effected by rest, by change of mode of life or change of habit (or of host for parasitic organisms), by processes of conjugation or fertilisation.

In dealing with Heredity some of the most important facts on which the theories of Darwin and Weismann are framed are set forth, a full account being given of those protists whose life is essentially vegetal. In the end the author concludes that "for the present at least the problem of heredity can only be elucidated by the light of mental, not material, processes." Perhaps the essay on what the author calls the "new force," or mitokinetism, will interest others besides zoologists. It is a remodelled edition of a paper by the author entitled "The Dual Force of the Dividing Cell." It gives an account of mitosis and of chromosomes, their motions and arrangements. The author endeavours to analyse the force expressed in the cell-figure with its physical analogy to what Fol called the "magnetic spectrum," to Faraday's lines of force, and to what the author calls "chains of force." We are introduced to "osmotic field of flow" and a field of tension. After surveying the spindle fields known to physicists the author comes to the conclusion "that the cell field shows the greatest analogy in its formation and behaviour to the electrostatic field between oppositely charged conductors, but that the force is no more electrostatic force than it is any of the other known dual forces." The name "mitokinetism" means a "new force" so far unknown in the physical world of non-living matter, obviously a supposition that raises the question of vitalism *versus* mechanicism. For the word "fertilisation," in its modern restricted sense, the author proposes to substitute the word "syngamy." Its function is to bring about "a cellular reorganisation that can be effected in no other way." To the "cultured laity," perhaps, the essay on the Transmission of Acquired Characters—sometimes called "the Lamarckian factor," which has been rejected by a large body of naturalists as non-existent—will prove of special interest. The transmission of acquired characters in plants from the highest to the lowest is admitted by all to a certain extent, and the author cites some instances of Lamarckian transmission in salamanders and other cases readily explicable by the transmission of acquired characters.

Whatever may be thought of the author's views on the problems of life and reproduction, we are glad to have his suggestive essays in a collected form, and set up in good bold, easily readable type.

Einführung in die Biochemie für Naturhistoriker und Mediziner. Von Dr. VIKTOR GRAFE, Privatdozent an der Wiener Universität. Mit 41 Abbildungen im Text. Leipzig und Wien: Franz Deuticke. 1913. Pp. 472. Price 13 marks.

THE last 30 years have seen the rise and development of that important branch of chemistry now known as biochemistry. Indeed, the average medical student has all too elementary a training in this subject, which grows daily both in extent and importance. The author assumes on the part of the reader a larger knowledge of chemistry and physics than is usually possessed by the average "mediziner," at least in this country. In the introductory chapter, however, he gives an account of organic chemistry and physical chemistry. His claim is that in no single text-book hitherto published is there an exposition of the biochemistry of vegetable as well as animal organisms, and his object is to show the unity of chemical processes pervading all living organisms. Some of the leading text-books are mentioned as works of reference, while several pages are given at the end to an enumeration of special papers dealing with the subjects discussed in the text.

The introduction runs to about 40 pages and deals with the physico-chemical laws of cellular activity, including such familiar subjects as osmotic pressure, diffusion, dissociation, hydrolysis, mass influence, formation of salts, solubility, exothermic and endothermic reactions, adsorption, radiant energy, ultra-violet light, fluorescence, and Brownian movement. Under radiant energy it is interesting to note that of the immense "stream of energy" continuously emanating from the sun to the earth only 0·2 per cent. is stored up by green plants in the form of chemical energy. Over 100 pages are occupied by what may be called the "chemical basis or materials of cellular action." This is practically a short account of organic chemistry, ranging from structural formulæ and isomeric compounds to enzymatic action. In dealing with proteins, the old nomenclature of "albuminoids" is retained. The figure of a crystal of oxyhæmoglobin from dog's blood strikes us as unusual. The short account of chemical reactions in the organism is well worth reading. A few pages are given to the cell in regard to plasmolysis, isosmotic coefficient, and hæmolysis. The rest of the text, by far the most interesting to physiologists, is devoted to metabolism in plants and animals—i.e., metabolism considered in its widest sense both as regards matter and energy. A succinct and suggestive account is given of the changes undergone by food in the animal body. We are glad to see the importance attached to mineral matters and to the part played by inorganic constituents in metabolism. The "end-products" in plant metabolism are dealt with in an interesting manner, as is the whole question of the absorption and transformation of energy in plants and animals. The "circulation" of such elements as carbon, nitrogen, sulphur, and phosphorus is traced in the vital and non-vital round. Over 40 pages are given to the pathology of metabolism. The work closes with an account of the chemico-physical basis for the artificial production of living forms, including some account of the work of Leduc, which was reviewed in THE LANCET of July 8th, 1911. The author concludes that "energy and matter are continuously in circulation, and life itself is one of the stages."

The work gives a comprehensive exposition of the newer

attitude of physics and chemistry in relation to biology, and is well worthy of perusal. It is obviously the outcome of a careful study on the part of the author of the chemical and physical processes which are common to animals and plants. We have pleasure in recording our appreciation of this "Introduction to Biochemistry."

LIBRARY TABLE.

University Reform in Medicine. By H. ELLIOT-BLAKE, M.R.C.S. Eng. London: John Bale, Sons, and Danielsson. Pp. 185. Price 11*s.* net.—Mr. Elliot-Blake's views on medical reform are already well known to our readers. His aim is, in short, to associate the Royal College of Physicians of London and the Royal College of Surgeons of England with the University of London, so that the three corporations may act as a university in themselves. In this, his latest work on the subject, he has collected his former arguments and has expanded them. An appendix gives a list of various letters and speeches dealing with the matter in hand, published and delivered previously to the publication of the book. In addition, Mr. Elliot-Blake has reprinted Sir Walter Raleigh's (the Elizabethan Sir Walter's) song, "Goe, Soule, the bodie's guest," together with a musical setting of his own, which, in marked contrast to the words, is of the most modern type.

Modern Probleme der Biologie. Sechs Vorträge gehalten an der Universität Jena im Dezember, 1912. Von CHARLES SEDGWICK MINOT, Professor of Comparative Anatomy, Harvard, Boston, Mass. Mit 54 abbildungen im text. Jena: Gustav Fischer. 1913. Pp. 111. Paper, 3 marks; bound, 4 marks.—These lectures represent the matured opinions on a variety of subjects to the elucidation of which the author himself has been a large contributor during the last quarter of a century. Minot began his career in Leipsic under Ludwig, to whom he expresses his indebtedness, but he feels himself constrained not to follow the so-called mechanical theory of life held by his master. Nor is he a monist, for there remains the possibility of accepting a dualistic philosophy as a solution of the problem of life. Harvard and Jena made an exchange for the time being of professors, Professor Eucken, of Jena, going to Harvard to deliver a course of lectures, and Professor Minot coming to Jena. The lectures were addressed to a "mixed public," and therefore they may be read with profit by those who are not pure biologists. The lectures deal with the New Cell Doctrine "cytomorphosis"—a term coined by Minot in 1901 to indicate all corporeal changes which cells or successive generations of cells undergo, the Doctrine of Immortality, the Development of Death. Formerly death was regarded as a necessary ending of life, but in recent times it has become probable that not all organisms undergo a so-called natural death. Those readers who are acquainted with the author's work on "Age, Growth, and Death," will be familiar with the lines on which the lecture is developed. Senescence is regarded as due to the increase and differentiation of protoplasm, and he will have nothing to do with the strange doctrine of Metchnikoff regarding the large intestine. Senility is a widely known phenomenon both in many animals which are devoid of a large intestine and in plants. But was it not Virchow—not Osler—who first said that "a man is as old as his arteries"? The next lecture deals with Sex, and of course there is an account of the chromosomes, with special reference to the most recent work on this subject. Lastly, is the Conception of Life. The author presents a very readable, instructive, and critical account of a subject which has made vast strides in recent years, and naturally his pages bristle with recondite facts and are thickly strewn with theories.

Ophthalmic Nursing. By SYDNEY STEPHENSON, M.B., C.M., F.R.C.S. Edin., D.O. Oxon., Ophthalmic Surgeon to the Queen's Hospital for Children, London. Third edition. With 80 illustrations. London: The Scientific Press, Limited. 1912. Pp. 229. Price 3*s.* 6*d.* net. *Eyestrain in Everyday Practice.* By the same author. London: The Ophthalmoscope Press. 1913. Pp. 139. Price 3*s.* 6*d.* net.—We welcome a new edition of Mr. Sydney Stephenson's little book on ophthalmic nursing. It is a difficult and laborious task to write on scientific subjects for lay readers. The technical term or phrase continually occurs to the mind, and has as continually to be rejected and replaced by some circumlocution. This book is written principally for nurses, and is well adapted to their requirements. It commences with an account of the structure of the eye and the germ theory of disease. Then follow chapters on remedies and their application, anæsthetics, the commoner operations upon the eye, dressings, and the nursing of operation cases. A chapter is devoted to diseases of the eye, the major part of which deals with ophthalmia neonatorum, a subject to which Mr. Stephenson has devoted much attention. Appendices contain illustrations of instruments, lists of instruments for various operations, and a glossary of medical terms. In "Eyestrain in Everyday Practice" Mr. Stephenson has collected articles contributed to various medical journals, and the Richard Middlemore Post-graduate Lecture, delivered in Birmingham in 1910. It would be difficult to write anything very new on eyestrain, ocular headaches, and so on, although the attempt is often made. Mr. Stephenson is too wise and too experienced to give his unqualified support to the exaggerated opinions expressed by Dr. G. M. Gould and others, but he deals more kindly with them than we should be inclined to do. He has read widely and incorporates the products of his researches in his articles, so that the book gives a good account of the disorders of which it treats. It will be instructive to general practitioners.

Celluloid, its Manufacture, Applications, and Substitutes. By MASSELON, ROBERTS, and CILLARD. Translated from the French by HERBERT H. HODGSON, M.A. Camb., B.Sc. Lond., Ph.D. Heidelberg. London: Charles Griffin and Co., Limited. 1912. Pp. 356. Price 25*s.*—Celluloid is now a very familiar substance, and its applications are manifold. We learn from this interesting account before us that it was discovered in 1869 by two printers, the brothers Hyatt, of Newark (New Jersey, U.S.A.), who were searching for an unyielding substance suitable for making inking-rollers. As is well known, celluloid is prepared by mixing nitrocellulose and camphor, the product being a "non-compressible substance difficult to twist and almost untearable." Its great defect is its strongly inflammable nature. On this point the chapters on uninflammable celluloids and substitutes have a special interest. It must be admitted that having regard to the enormous number of useful applications to which celluloid may be put, it is very desirable that every effort should be made to reduce its intense inflammability. The direction in which these efforts have been made are well described in the book, but the authors state that the results are not satisfactory, since the admixture with celluloid of a substance which evolves a gas inimical to combustion (which is one suggestion) is not able to check the fierce energy with which celluloid burns, and the addition of extraneous materials—e.g., mineral salts—scarcely ensures homogeneous products, and these have properties usually very different from those of celluloid. Few of the celluloid substitutes, in the authors' opinion, have a real industrial value, and none is able to replace celluloid in all its applications, but "the best future appears reserved for the acetates" (of cellulose), which are now being produced with some success in the making of films for

photography. The book contains a very interesting account of the manufacture of celluloid, and its publication in the English language will be welcomed by a wide technological *clientèle*, particularly as very little literature on the subject exists in a collected form. The translator has done his task well, his considerable technical experience being, of course, of the greatest assistance to him in this matter.

Our Village Homes, Present Conditions and Suggested Remedies. By HUGH ARONSON, M.A. Oxon., Barrister-at-Law. Preface by Lord HENRY BENTINCK, M.P. London: Thomas Murby and Co. 1913. Pp. 142. Price 2*s.* 6*d.* net.—None will contradict the statement of Lord Henry Bentinck, in his brief and temperate preface to Mr. Aronson's little book, that the problem of rural housing is one to which it is necessary that we should give immediate attention, or gainsay his description of the countryman as inarticulate politically in comparison with the clamorous urban voter. In the same sense as does Lord Henry Bentinck we would welcome Mr. Aronson's work as a useful contribution to the literature of a subject upon which probably the last word will not be said for many a day. Mr. Aronson paints in lurid tints the insanitary conditions of housing frequently to be found in rural districts, drawing his picture from personal observation. He discusses the causes which he considers have led to the comparative inefficacy of modern legislation having for its object the better housing of the country labourer. His suggested remedies for the difficulty presented by low wages which cannot economically be made higher, and by rents which cannot economically be made lower, are apparently the assignment of a substantial slice of land with every cottage, and the provision of common pasturage, combined with coöperative disposal of produce. It is difficult to prophesy in what direction the solution of the problem will ultimately take us; but it may be submitted, as some consolation, that the labourer, even in the country, has gained in the general conditions of his life more than the farmer or the landlord by the developments of the past half century, and that there is no indication that modern progress has come to a standstill, although it still finds some obstacles very difficult to surmount.

MISCELLANEOUS VOLUMES.

A HETEROGENEOUS collection of books and pamphlets, some of them having only an indirect medical interest, is before us this week.

We reviewed the first edition of Miss MARY E. BIRT'S little pamphlet on *Invalid and Convalescent Cookery*, of which the second edition (Bristol: John Wright and Co. 1913. Pp. 32. Price 6*d.* net) is before us, at some length in THE LANCET of May 18th, 1907. While, as we then stated, the book is admirable on the whole, a certain looseness of construction and an ambiguity of expression mar its value. We quoted three instances of this in our former review. Although our criticisms pointed to real defects, all remain unchanged, and there are others.——*Voice Training for Choirs and Schools*, by CYRIL BRADLEY ROOTHAM, M.A., Mus.D. (Cambridge University Press. 1912. Pp. xlvi.–110. Price 4*s.* net), is an amplification of a paper read before the International Congress of Musicians in London (May, 1911). It relates mainly to the pædagogy of the vocal art rather than to its physiological aspects, though these, of course, are necessarily touched on more or less. The second part consists of the vocal and pianoforte score of exercises with a few pieces, including the old round "Sumer is icumen in," which is supposed to date from A.D. 1226.

In *The Newspaper* (London: Williams and Norgate. Pp. 256. Price 1*s.* net), by Mr. G. BINNEY DIBBLEE, which is one of the admirable Home University Library Series, we have an essay on the function of a newspaper, followed by an interesting account of the various processes involved in its production and distribution. This again is followed by a discursive account of the principal newspapers in London, the provinces, and the Empire, with some reference to the chief continental and American papers. The story of THE LANCET is briefly but interestingly sketched on pp. 194–196. In the concluding chapter, on Journalism and Journalists, many instances are given showing the influence that may be exercised upon the public mind by the attitude adopted by the journalist towards vital problems.——Among these vital problems in which the newspaper press, if judiciously handled, can exercise much influence for good upon the people at large is that of race improvement. Popular handbooks also are of service. In *Education and Race Regeneration* (London, New York, Toronto, and Melbourne: Cassell and Co., Limited. 1913. Pp. 64. Price 6*d.* net), which is one of Cassell's Race and Sex Booklets, Sir JOHN ELDON GORST discusses the bringing up of children for parenthood, the rights of children, the education of the Home Office, the education of the Local Government Board, and the education of the education authorities. He advocates proper instruction in sexual knowledge. Though all will not agree in their entirety with the views expressed in the last three sections, which necessarily have a semi-political aspect, they may be advantageously pondered by all interested in the subject of education.——The proper performance of domestic duties has a decided bearing upon the well-being of the race, both mental and physical. For the person who knows little or nothing of the A.B.C. of housekeeping, *Practical Household Management*, by M. A. FAIRCLOUGH, L.C.A. (London: The Stanley Publishing Company, Limited. 1912. Pp. 159. Price 2*s.* net), is a very sensible, comprehensible, and thorough setting out of everything—hygiene, servant and mistress, household linen, spring cleaning, laundry work, marketing, economy, food and cooking, domestic accounts, and so forth—that it is necessary to learn. The book also contains many hints and recipes that will be of use to the more experienced, and concludes with a useful chapter by a lawyer on the National Insurance Act as affecting mistresses and servants.——*Dry Cleaning and Garment Drying*, with an Appendix on Wet Cleaning, edited by C. F. TOWNSEND, F.C.S. (London: The Power Laundry Company, Farringdon-street, E.C. Pp. 152. Price 1*s.* net), is an elementary text-book on the subject which should prove useful both to those directly concerned and to all who wish to know something about the process employed in dealing with garments when sent away from home to be cleaned.

Guides and directories, of course, are of general interest. A guide to the municipal, commercial, and social life of the City of London briefly describes the character of *The City of London Year Book and Civic Directory for 1913* (London: W. H. and L. Collingridge. Pp. 382. Price 5*s.* net). It contains lists of the members of the Corporation and the London County Council, with articles dealing with the year's work of these bodies; lists of members of, and the history and activities of, the livery companies; members of the Stock Exchange, Lloyds, and the Baltic; lists of city schools; roll of the freemen of the City, and so forth.——*The School Dentists' Society, its Object and Aims* (Watford: Michael and Son. 1913. Pp. 116. Price 1*s.* net), is now in its second edition, and besides the names of the members of the society contains much interesting information concerning school dentistry and its present condition in the British Isles, the colonies, United States, and the principal countries of Europe. The School Dentists' Society,

which is affiliated with the Child Study Society and the National League for Physical Education and Improvement, has for its objects mutual assistance in the promotion of school dentistry and the holding of meetings for the consideration of subjects connected with the special work of school dentists.

JOURNALS AND MAGAZINES.

The Journal of Laryngology, Rhinology, and Otology.—The May number contains an article by Dr. Raymond Vérel on the Significance of Fever in Cases of Mastoiditis complicating acute and chronic suppurative otitis media. The article is a report of an investigation to test the accuracy of the statement that mastoiditis of itself does not cause the temperature to rise above 99° or 100° F. The investigation is based upon 125 cases operated upon in the ear and throat department of the Royal Infirmary, Edinburgh, during the years 1910 and 1911. The cases of chronic otorrhœa which underwent the complete operation because conservative treatment failed to cure the discharge were excluded, since in them there was never any question of acute mastoiditis, nor was there any elevation of temperature before operation. The following conclusions are arrived at: (1) In 96 of the 125 cases in which acute mastoiditis was associated with acute or chronic otitis media the temperature was under 100° F.; (2) of the remaining 29 cases in which fever was present an intracranial complication was found in 22 cases, while in two cases the temperature could be explained by the presence of such conditions as septicæmia and pulmonary tuberculosis, in another two cases there was no mastoiditis; (3) in only three of the cases no condition other than the mastoiditis was found at operation to account for the fever. Thus mastoiditis of itself very rarely gives rise to a temperature of 100° F. or over; if a higher temperature be present an intracranial complication or some general toxic condition must be suspected.—The articles on Diffuse Cranial Osteomyelitis from Nasal Sinus Suppuration, by Dr. Dan McKenzie, which appeared in the January, February, and March numbers have been reprinted in pamphlet form. It is generally agreed amongst rhinologists that the frontal sinus is undoubtedly the more common site of origin of osteomyelitis, both localised and diffuse. Of the 38 valid cases collected by Schilling, Gerber, and Luc, 36 originated in the frontal sinus and two in the maxillary antrum. After adding to these the cases appended to Dr. Dan McKenzie's paper there are 45 cases originating in the frontal sinus and three in the antrum. The questions naturally arise, Why is frontal sinus suppuration more prone to lead to osteomyelitis than is suppuration in the maxillary antrum? And why does frontal sinus suppuration lead to fatal osteomyelitis more frequently than does maxillary antrum suppuration? Schilling, and others, are inclined to suggest that the answers are to be found in the disposition of the diploë of the frontal bone with relation to the sinus. Until the etiology of this fatal disease is ascertained every operation on the frontal sinus will be lacking that full and comfortable assurance which mastery of all the natural eventualities of the situation alone can confer.

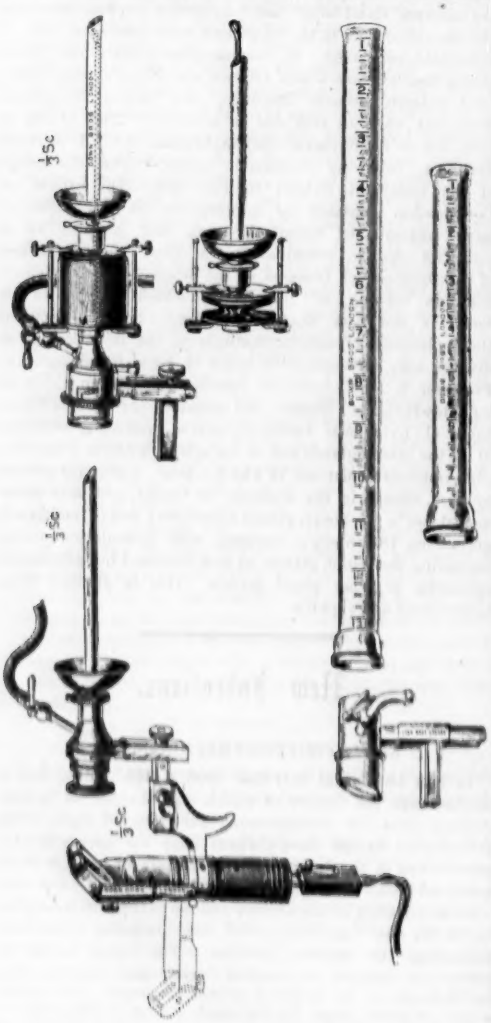
Jahreskurse für ärztliche Fortbildung. March, 1913. Munich: Lehmann. Price 18 marks per annum.—The subjects reviewed in the present issue are diarrhœa and constipation, diseases of the stomach, pseudo-leukæmia, myeloma, and splenomegaly, with some remarks also on gout, diabetes, and some physical processes.—Professor Fleiner divides the varieties of Diarrhœa into the following groups: 1. Dyspeptic diarrhœa due to gastric causes, such as relaxation of the pylorus associated with deficiency of hydrochloric acid in the peptic juice, or to reduced activity of the pancreatic ferments. These may lead to fatty diarrhœa or to excess of proteins or of starch in the stools, undigested meat fibre being particularly characteristic. The same effects may also be due to over-feeding, and are, of course, exaggerated when the bowel wall is damaged by bacterial toxins. Some light may be thrown upon the exact action by means of skiagraphy after bismuth feeding. This has shown that castor oil excites the small intestine to increased peristalsis, that senna acts on the large intestine, colocynth on the large and small bowel, and magnesium sulphate increases the amount of fluid in the large and small intestine, and so stimulates peristalsis. 2. Hæmatogenous diarrhœa. Here belong the diarrhœa which follows a chill, producing intestinal catarrh, uræmic diarrhœa, and various occupation diarrhœas, such as that due to mercury. There is also a form due to anaphylaxis, cholera, typhoid, &c. 3. Nervous diarrhœa, following emotional upsets. The discussion of the treatment follows routine lines.—The article on Constipation contains an appreciation of the value of large enemata of warm olive oil, half a pint to a pint, for spastic constipation.—A good general review of the Diagnosis of Diseases of the Stomach and Duodenum contains nothing of importance which is not to be found in the best English literature.—Schade discusses the application of osmotic methods to the investigation of disease, and particularly in cases of renal insufficiency.—Professor E. Meyer writes on Pseudo-leukæmia, in which he includes Hodgkin's disease, and classifies the various forms thus: (1) Lymphatic Pseudo-leukæmia, presenting swellings of all the lymph glands and of the spleen, without leukæmia; (2) Lymphosarcomatosis, in which a large malignant growth appears, usually in the abdomen or thorax, and later forms metastases in the lymph glands elsewhere; and (3) malignant granuloma (Sternberg's disease), with granulation tissue occupying the lymph glands, at first localised but afterwards spreading to other gland groups. This is distinct from tuberculosis and syphilis.

New Inventions.

AN IMPROVED URETHROSCOPE.

IN THE LANCET of July 21st, 1906, p. 169, I described a urethroscope the feature of which was the use of a condensing lens for concentrating the rays of light. The introduction of the three-filament lamp has necessitated a remodelling of the design, and an instrument has now been produced which gives a brilliant illumination, and when used with air inflation of the urethra and an external telescope is by far the most satisfactory and least irritating method of examining the anterior urethra. The light is thrown down the cannula in parallel rays, and dulness due to distance is to a great extent obviated. The telescope, if used, must be focussed during a trial use of the urethroscope. The object of the operating attachment is to allow applications and small operations to be performed in the air-distended urethra under direct control of the eye. The rubber concertina-like mount, while allowing free movement, prevents the air escaping from the urethra, and is interposed between the nozzle of the urethroscope and the cannula. The intra-urethral probe is fixed into a female screw, which is fastened to the inner surface of the nozzle of the urethroscope, a spare nozzle being used. The urethroscope thus becomes the handle of the probe. By the action of closing the rubber mount the probe is projected beyond the distal end of the cannula, and any duct, lacuna, or sinus can be easily entered, owing to the flatness, smoothness, and fixity of the urethral wall. A mere trace of solid silver nitrate is melted on to the end of the probe. A little force

is necessary to overcome the internal air pressure. The lower disc of the rubber mount should be firmly grasped with the finger and thumb of the left hand, and the body—not merely the handle—of the urethroscope held with the right. A preliminary trial of the instrument must be made before use on every occasion, as, owing to the necessary mobility of the rubber mount, the rays of light can be easily misdirected. This is liable to happen if the probe should point in a faulty direction. The probe must be bent if necessary into the correct position while retaining the best rays of light down the tube.



The trial use is carried out by pressing the end of the cannula against a towel or by plugging its end. A couple of knives, a curette, electrolytic needle and probe, and a fine syringe complete the intra-urethral armamentarium. The actual cautery requires a separate nozzle. For electrolysis the rubber mount is already insulated, and all that is necessary is to fix the battery wire, usually the negative, on to the metal part of the urethroscope, the other wire being connected with the patient's thigh by a large plate moistened with salt solution. After inserting the cannula into the urethra the rubber mount must be firmly and securely fixed into it, and its side-binding screws which keep it in the extended position must not be unfastened before the light has been switched on and air let in under direct visual control.

Messrs. Down Brothers make rectal, vaginal, and aural specula for use with this instrument, and it is also in common use for sigmoidoscopy.

W. WYNDHAM POWELL, F.R.C.S. Eng.

Wimpole-street, W.

THE SEVENTEENTH INTERNATIONAL CONGRESS OF MEDICINE (1913).

SECTION OF STOMATOLOGY.

THIS section will hold its meetings in the lecture theatre of the Royal Dental Hospital. The President of the section is Mr. Morton A. Smale and the secretary Mr. J. F. Colyer, 11, Queen Anne-street, W.

The following discussions have been arranged: The Pathology and Treatment of Periodontal Disease, with Dr. N. N. Znamensky and Mr. E. B. Dowsett as reporters. The Relation of Nasal Obstruction to Dental Disease, with Dr. Jules Ferrier and Mr. J. G. Turner as reporters. Dental Disease in Relation to Public Health, with Dr. Harold Williams and Dr. J. Sim Wallace as reporters. The Supervision of the Health of Children between Infancy and School Age. This discussion will be held conjointly with the Section of Hygiene and Preventive Medicine. Mr. W. W. James will report on behalf of the Stomatological Section, and Dr. Leslie Mackenzie on behalf of the Section of Hygiene and Preventive Medicine. The final discussion of the meeting will be on Reflex and Functional Disturbances in Connexion with Teeth, Dr. Rousseau-Decelle and Dr. A. W. W. Baker being the reporters.

A useful list of papers will be read and the chief interest will probably centre around the following: Some Observations on the Enamel Organ and its Products, by Mr. A. S. Underwood and Mr. A. W. Wellings, assisted by Professor T. G. Brodie and Mr. Lovatt Evans.

In a paper dealing with the Relation of Mouth Conditions to Cancer of the Alimentary Canal, Mr. S. F. St. J. Steadman will place before the section the result of an extended clinical investigation of cases in various London hospitals. Dr. J. Zilz, of Hungary, has promised a paper on the Question of General Infection *vid* the Pulp of the Tooth, and Dr. Besson will discuss in another paper Suppuration in the Temporal Fossa of Mouth Origin. Mr. K. W. Goadby is contributing a paper on Arthritis Deformans of Mouth Origin. Altogether, 16 papers have been promised.

An important feature of the meeting will be a clinical gathering at the Royal Dental Hospital on Monday, August 11th, at 5 o'clock, of cases of interest collected from the various dental hospitals in London. It is anticipated that between 70 and 80 patients will be shown. In addition there will be an exhibition of pathological specimens and stereoscopic skiagrams. To this gathering the Stomatological Section welcomes any members of the Congress.

A few special entertainments have been arranged. A dinner will be held at the Hôtel Métropole on Friday, August 8th, and on Saturday the President of the Section will give a garden party at Phyllis Court, Henley.

MEDICAL SOCIETY OF LONDON.—At a general meeting of this society held on May 19th, the following officers were appointed for the next session. President: Sir David Ferrier, F.R.S. Vice-Presidents: Percy Lush, M.D., Arthur E. Barker, F.R.C.S., J. Walter Carr, M.D., and James Berry, F.R.C.S. Treasurer: J. Mitchell Bruce, M.D. Librarian: Arthur Francis Voelcker, M.D. Honorary Secretaries: Robert A. Young, M.D., and George E. Gask, F.R.C.S. Honorary Secretary for Foreign Correspondence: F. Parkes Weber, M.D. Council: W. Ironside Bruce, M.D., Guthrie N. Caley, M.D., Sir Watson Cheyne, Bart., F.R.S., Herbert S. Clogg, M.S., Edred M. Corner, M.C., Sir Anderson Critchett, Bart., C.V.O., Duncan Fitzwilliams, Ch.M., S. H. Habershon, M.D., T. B. Hyslop, M.D., Corrie Keep, C.M., Frederick Langmead, M.D., H. J. Marriage, F.R.C.S., Zebulon Mennell, M.B., D'Arcy Power, F.R.C.S., Guthrie Rankin, M.D., David Lloyd Roberts, M.D., W. J. Sheppard, M.D., James Sherren, F.R.C.S., F. J. Smith, M.D., and Sir John Tweedy, LL.D. Dr. F. M. Sandwith has been appointed Lettsomian lecturer, and Mr. Robert Jones (Liverpool) orator.

THE LANCET.

LONDON: SATURDAY, MAY 24, 1913.

The Coroner's Inquest.

WE published last week a paper read by Dr. W. A. BREND before the Medico-Legal Society, entitled, "The Futility of the Coroner's Inquest," a superscription which sufficiently indicates the author's point of view. The subject is one of considerable interest to the public and to the medical profession, and if we hesitate to accept the term "futile" as applicable to coroners' inquests in general, this is not because we are unduly prejudiced in favour of the maintenance of a venerable judicial office with which the history of THE LANCET has been picturesquely concerned, but because, in our opinion, the coroner's inquest is not essentially futile, though the procedure of the coroner's court may require modifications. Moreover, the usefulness of the coroner's inquest has been largely increased during recent years by the zeal and industry of modern coroners, acting without that legislative encouragement and assistance which would render their labours more effective. Believing as we do that legislative reform is needed we welcome the criticisms of the present position which Dr. BREND offers, and recommend the perusal of them as interesting and suggestive. But to do so does not imply that we accept his facts without question, or that we endorse all his proposals for drastic alteration of the coroner's position and duties.

In the first place we are not altogether convinced as to the alleged obscurity of the fundamental purpose for which a coroner holds an inquest. There is, no doubt, a lack of uniformity in the practice of coroners, to some extent due to differences of locality and circumstances, and also to differences of opinion and to human idiosyncrasies which affect magistrates and judges, as well as coroners. Amendment of the words of the statute which govern the holding of inquests might render them more explicit and conduce to uniformity of practice, but the intention upon which the coroner's office, as it now exists, is founded appears to be sufficiently clear. An inquest is to be held under the Coroners Act of 1887 where there is reasonable cause to suspect that a person has died either a violent or an unnatural death, or has died a sudden death of which the cause is unknown, or where a person has died in prison or in such place or circumstances as to require an inquest in pursuance of any Act of Parliament. The object is that an inquest should be held in a class of cases of death in which the public interest demands inquiry, either because there may be someone to blame for the death, or because there may be some cause responsible for the death the discovery and ventilation of which will be of service to the community. The degree of blame may vary. The inquest may have as its result the formulating of a criminal charge against some person or persons, or it may not; it may end in the establishment of the fact that death was natural, or it may show that something has led to it which, without requiring the conviction, punishment, or even the censure of any person or persons, may still demand attention in the interest of the public safety. The words "violent or unnatural" death seem to us to supply the general intention and to explain the use of the expression "sudden death of which the cause is unknown" as meaning a death which may perhaps turn out on inquiry to be violent or unnatural, and as intentionally excluding those deaths in which the pathological cause alone is obscure. In other words, the coroner's jury, not perhaps a tribunal fitted for the final elucidation of an obscure case of criminal responsibility, is asked to say as a body of laymen, with all the limitations of such a body, what its collective opinion is in the public interest. Much has been said and written upon the subject of juries, whether in coroners' courts or not, and their sometime inefficiency for the determining of questions of fact, where those issues depend upon scientific evidence, possibly conflicting in character, will not be denied. No class of scientific witnesses appears more often before juries than medical men, and no medical man would contend that a jury is the most competent body obtainable for the weighing of medical evidence. At the same time we must remember the public side of the question. We must bear in mind that no judge has ever expressed anything but gratitude for the presence of a jury where doubtful questions of fact have had to be determined in connexion with a serious criminal charge, and also that the jury in England enjoys, on the whole, the confidence of the public—a very desirable circumstance where the administration of the law is concerned. To put the case shortly: for such questions as coroners' juries have submitted to their consideration they probably inspire the public with more confidence than their capacity warrants, but at the same time they are not lightly to be dispensed with.

If the law should be amended, however, as suggested by the report of the Departmental Committee which some years ago considered the question of the reform of the Acts relating to coroners, fewer cases will come before juries than now in which evidence is exclusively, or almost exclusively, medical. The coroner, if empowered to order a post-mortem examination without necessarily holding an inquest, will in many cases be relieved of the necessity for public inquiry, and the recommendation of the committee with regard to deaths under anæsthetics should cause a discretion to be definitely assigned to coroners to dispense with inquests in these cases, although retaining the duty of inquiry. Such deaths are not "violent" or "unnatural," and some of the inquests in connexion with them have done no public service, but rather the reverse. An amendment of the law rendering more effective the inquiries of the coroner made before deciding to hold an inquest would make it more necessary than ever that coroners should have medical qualifications, and the desirability of all coroners being so equipped for the duties of their office has long been insisted upon in THE LANCET. But when any legislative reform of the law relating to coroners will take place it is impossible to say. It has now been so long delayed

that it would be rash to venture upon any prophecy with reference to it. We do not, moreover, anticipate that such reform as may take place will go so far as to convert the coroner either into a purely judicial functionary, investigating only cases where manslaughter or murder is charged against an individual, or into a medical official determining only the pathological cause of death. We are inclined, further, to believe, and we think that the majority of coroners would confirm us in our belief from their experience, that the inquest which has for its twofold object, first, the general elucidation of the cause of death and, second, the possible assignment of blame where someone has died what appears at first sight to be an unnatural death, is a very useful institution from the point of view of safeguarding the public. The fact that the coroner is not trying an individual who is alive before him, but is investigating the causes which have conduced to a certain death, with only the possible contingency that some person or persons may be committed for trial or otherwise affected by the verdict, allows information to be tendered and evidence to be heard in a manner which makes for the discovery of truth and the vindication of justice. We doubt if the case of any person, afterwards tried at assizes, is ever substantially prejudiced, so that the ends of justice are defeated, by the fact that evidence is given at an inquest which is not afterwards admissible at the trial of the person in question, but we admit that this is a matter upon which legal opinion is divided. We are also of opinion that the coroner's inquest throws light upon many cases of death where no charge of manslaughter or murder follows, but where the effect of public inquiry and of the rousing of public opinion is extremely salutary; in this way the fear of the coroner's inquest may tend to avert death in cases of which naturally no records or statistics exist. These are gains to the public which outweigh the occasional infliction of the undeserved and regrettable pain of public inquiry upon innocent individuals. At the same time, criticism of defects in the existing law, such as those made in Dr. BREND's interesting paper, should prove useful in calling attention once more to the fact that the law requires amendment. Matters are thus suggested for the consideration of those who some day may make themselves responsible for much-needed reform.

The Treatment of Arterio-sclerosis and High Tension.

THE subjects of arterio-sclerosis and high tension have recently attracted considerable attention, and the discussions at the Medical Society of London and at the Section of Balneology and Climatology of the Royal Society of Medicine raised several points of considerable interest.[1] The introduction of mechanical methods of estimating arterial tension and their adoption almost as a routine method have also given rise to many investigations as to the significance of alteration of the tension under varying circumstances. The term arterio-sclerosis has been rather loosely applied to any thickening and rigidity of the vessel wall, and the etiology is by no means simple, several factors being concerned in its production. The physiology and pathology of advancing age have constantly occupied the observations of physicians. It has been truly stated that old age may be a "state," or a "disease," but the dividing line between these two conditions cannot be defined with accuracy. In estimating the physiological age of an individual stress has always been laid on the state of the arterial walls, and the well-worn phrase, "a man is as old as his arteries," has been accepted with more confidence than it really deserves. That arterio-sclerosis is one of the most obvious manifestations of old age is generally accepted, but exactly how the change is brought about is still a matter for investigation. It is accepted that certain constitutional disorders may hasten the process, as gout and rheumatism. Syphilis, too, is a frequent cause of early vascular degeneration, and high living—i.e., excess of food and alcoholic drinks—also has an important bearing. To these causes must be added the physical and mental strain of modern life, also auto-intoxication, probably largely due to faulty digestive processes. Accompanying the changes in the vessels an increase in arterial tension is observed. The normal systolic pressure from 18 to 30 years of age may be accepted as being from 110 to 140 mm. Hg, whilst between 60 and 70 years of age 130 to 165 mm. may be taken as the usual physiological measurement. At one period it was apparently assumed that if the tension was abnormally high, say 200 mm. and upwards, means should be taken to attempt to lower it, and various drugs were tried, but with only partial success. Now, however, this method of procedure is not universally adopted.

Many of the points we have mentioned were carefully reviewed at the discussions we have mentioned. Dr. F. DE HAVILLAND HALL, who introduced the subject at the Medical Society of London, after reviewing the various conditions causing arterio-sclerotic changes in the blood-vessels, laid stress on the importance of regulation of the diet and relieving mental strain, and he considered that auto-intoxication was a powerful etiological factor. He was of the opinion that vaso-dilator drugs had been indiscriminately and injudiciously employed, and gave support to the view that high pressure was an effort of Nature to maintain the balance of the circulation in adverse circumstances, and that it should not be interfered with unless there were reasons, such as anginal pains or headache, to justify the employment of these drugs. Sir LAUDER BRUNTON introduced a new element into the discussion by referring to the condition of the blood in cases of high tension. He was of opinion that, when considering this condition and the means of lowering it, attention must be directed not only to the power of the heart and the contraction of the vessels, but also to the viscosity of the blood, which, by interfering with the easy circulation through the capillaries, would oppose a resistance at the periphery, and thus raise the blood pressure in general. He had found that bleeding or the administration of oxygen was beneficial. Dr. A. P. LUFF maintained that the most important factor in treatment was to diminish the production of toxins in the gastro-intestinal tract and their absorption therefrom, which was effected by ensuring a free action of

[1] THE LANCET, May 3rd (p. 1241) and 10th (p. 1313), 1913.

the bowels and a reduced consumption of meat and alcohol. In a paper read before the Balneological Section of the Royal Society of Medicine, Dr. A. MANTLE expressed opinions which were in accord with those held by Dr. DE HAVILLAND HALL and also by Sir THOMAS OLIVER—namely, that supernormal arterial pressure is not itself a primary condition to be attacked or controlled as such.

One of the most interesting points in connexion with arterio-sclerosis and high tension and their treatment is the part played by auto-intoxication. If this process can be prevented or controlled benefit will naturally follow. The regulation of the diet is one of the indications to be studied, and most physicians are of opinion that red meats should be avoided, and that alcohol, tobacco, and a large amount of tea should be forbidden. Equally important is the necessity of clearing the bowels of all mucus and food matters Herein probably lies the advantage of hydrotherapeutic measures as adopted at the spas. Regular purgation is beneficial, and waters containing a fair proportion of common salt, the sulphates of sodium and magnesium, and free carbonic acid are to be recommended; to this must be added the general *régime* of a spa diet and exercise, which is doubtless a powerful factor in the benefit derived from a course of treatment at the well-known spas, both English and foreign. Whether the natural waters have a more potent effect than the use of aperient substitutes has been much discussed, but the general opinion seems to be that a water taken at the source has a more powerful effect than a similar mixture made artificially. The discovery of radium in certain waters has strengthened the contention that the natural waters are superior, both for the purpose of drinking and bathing. Effervescing baths are believed by many physicians to have a more marked effect on lowering blood pressure than ordinary water at a similar temperature, and the use of the natural medicinal springs by people for centuries indicates the benefits that have been received. The majority of those who took part in the discussions to which we have referred were of the opinion that the nitrites, iodide of potassium, and other drugs used for the purpose of lowering blood tension are only temporary in their action and must be given with caution. The general conclusion is that the management of a patient's daily life and hydrotherapeutic measures suited to the particular case are the chief means by which arterio-sclerosis may be treated and excessive blood tension lowered.

From a Lay Point o View.

IT is good for us all on occasion to see ourselves through the eyes of others, and when the intermediary is a distinguished man of affairs with a record of administrative capacity that can only be characterised as splendid, we are bound to read his opinion on medical practice with attention and respect. Sir HORACE PLUNKETT has given his experiences and impressions of the Battle Creek Sanitarium in a lecture recently delivered before the Royal Dublin Society and now published,[1] which deserves attentive consideration. This sanitarium—we follow the spelling adopted by its founders—is probably known by name to most of our readers. It was started in a small farmhouse in Michigan in 1866, much enlarged ten years later, rebuilt after a fire in 1902, and now carries on a very extensive work, partly philanthropic and partly scientific and educational. The health-seeker undergoes (or perhaps it were better to say "enjoys") a course of treatment chiefly dietetic and gymnastic, least of all medicinal, the main purpose being two-fold: first, to cultivate a healthy and avoid a morbid interest in personal hygiene, and secondly, to give the widest possible opportunity to the "Battle Creek idea," which appears to be the comprehension of simple physiology. The result was, in Sir HORACE PLUNKETT'S case, and in his own words, "to make me treat my own machinery almost as rationally as I treat that of my motor-car." The common idea that ill-health is incidental to a sedentary life is combated, vegetarianism advocated, and a low protein diet insisted on. A natural open-air life is led, and the results are, as might be expected, most satisfactory. Two considerations Sir HORACE PLUNKETT submits to the medical profession. First, alluding to the "drug superstition," he says: "Is not the scientific (which need not, therefore, be the unintelligible) inculcation of faith in Nature's healing process a safer and surer road to health than psychotherapy, with the vista of illusion and the opportunity for unprofessional charlatanism it opens up?" Secondly, he says, "no concession ought to be made to the prejudices of maternal psychology in the treatment of babies, to whom bottles (with the one exception) are about as much use as a good bedside manner to a sick cow." No doubt much of the medicine that is now prescribed is rendered necessary by the insistence of the public upon having a bottle, which is so much easier to take than advice, but such belief in physic is steadily, perhaps rapidly, declining, at any rate on this side of the Atlantic.

Sir HORACE PLUNKETT has some constructive suggestions, which are opportune when grave danger of a general lowering of standards in medical practice arises in connexion with the working of the National Insurance Act. He advocates that the medical profession should teach, that the public might learn, how to adjust our lives to our work so as to develop and sustain the maximum of efficiency and cheerfulness. The public, as it grows enlightened, should then help to bring home this knowledge to the masses of the population in town and country. He is convinced that in medical practice a more thorough diagnosis is needed to give a fuller confidence in medical science, and to obtain this he suggests that an institute should be established similar to that at Battle Creek. Existing laboratories and clinical institutions are not, he considers, sufficiently unified to meet the public needs, and there is no doubt that he could make out a good case for this view. In conclusion, the benefits of medical inspection of school children are alluded to, and the immense saving of suffering, and even of life, is insisted upon which would result if poor people were taught not to postpone the obtaining of medical advice until driven to do so by acute pain. In the two matters of education of the patient and insistence upon a rational dietary Sir HORACE PLUNKETT eulogises the Battle Creek Sanitarium,

[1] Some Tendencies of Modern Medicine from a Lay Point of View. By the Right Hon. Sir H. Plunkett, K.C.V.O., F.R.S. Dublin: Eason and Son. 1913.

while he urges on the public and the medical profession that the function of the physician as an adviser in the maintenance of health and prevention of disease should be recognised far more than it is at present, tentatively suggesting that steps be taken to give to the private practitioner the advantage in diagnosis to be derived from such an institute as that which he describes. A general physical examination would in this way be provided for the health-seeker who can afford it. It will be seen that the point of view of the layman, when the layman is an experienced man of affairs like Sir HORACE PLUNKETT, is one which the medical profession can fully appreciate. That prevention is better than cure we shall all agree, that a general knowledge of physiology would be valuable to the community we all must feel, and we would fain hope that the practice of periodical clinical examination, without waiting for actual illness, is already growing more usual in this country. We admit also that a fully equipped institute such as that described in Sir HORACE PLUNKETT'S address would be an advance in some circumstances, though certain provisions would have to be made against charlatanism. The one moral of Sir HORACE PLUNKETT'S pamphlet is that a medical practitioner should be rewarded for keeping his patients in good health rather than for healing them in sickness; but obviously the patient must, on this principle, coöperate *ex animo* with his physician. The hygienic discipline that in a retreat such as Battle Creek is willingly submitted to would too often be found impossible under the ordinary conditions of civilised town life at present existing. A wise and witty tract seems to have overlooked this great difficulty.

Annotations.

"Ne quid nimis."

NON-OPERATIVE TREATMENT OF MALIGNANT DISEASE.

THE melancholy truth that at present the only radical method of treatment for malignant growth is surgical removal was clearly shown by the course of the recent discussion at the Therapeutical Section of the Royal Society of Medicine. In spite of the prolongation of the debate over three meetings, and the ability with which it was carried on by a large number of speakers, little evidence was forthcoming that any of the alternative methods which have so far been tried can do more than palliate the affection. It is probably true that we can expect little advance in therapeutic measures so long as the essential nature of the disease remains obscure. If it could be shown that a parasitic organism was responsible for the appearance of these formations of rapidly growing new cells, there would be good ground for hope that a serum or vaccine, or perhaps a chemical agent, such as salvarsan, might be found to kill the invader or to strengthen our resistance to its ravages; but unfortunately the most recent researches into mouse cancer as well as the suggestive experiments of H. C. Ross on the effects of tar products in inducing epithelial proliferation seem to point to other modes of causation depending on intrinsic conditions more difficult to control. Among the therapeutic measures discussed at the debate we find an extraordinary variety of methods having apparently nothing really in common; yet good results were claimed for all of them. In one group we may place such agents as snake venom, vaccines, serums, and Coley's fluid, all depending on substances manufactured by living organisms: and perhaps we may class with this group the attempts that have been made to influence or prevent malignant disease by the use of special dietaries, or by ferments or extracts of ductless glands. In a second group are inorganic bodies such as arsenic and colloid copper; and in a third class come the various physical agencies, such as X rays, radium, and diathermy. It is remarkable that at the present time divergent views are held as to the mode of action of radiations, whether derived from radio-active substances or from electric discharges, one school holding that such rays act directly on the cells of the malignant growth and lower their vitality, while others maintain that a stimulant activity is exerted on the healthy cells, which are thus enabled to oppose more vigorous resistance to the neoplasm. Whatever the true action may be, it is undoubted that very noteworthy diminution, and even disappearance, of tumours may follow treatment by radiation, and in the case of rodent ulcer, which is usually regarded as an epithelial tumour of low malignancy, real cure may be thus effected. It is, however, in superficial growths that this mode of treatment is most effectual, and in such situations surgical removal is generally possible, and is undoubtedly to be preferred. In deeply situated tumours little can be expected from radiation. An interesting suggestion was made that it might be possible to introduce into the system some substance which would be acted on by the X rays and give off secondary rays in contact with the tissues, thus carrying the therapeutic effect throughout the body, but this possibility is as yet purely theoretical. If, however, a true remedy for malignant disease is as yet to seek, much may be done to palliate the symptoms of the malady. Useful suggestions were made as to the use of such drugs as aspirin and phenacetin for relief of pain; as to the treatment of ulcerated surfaces with peroxide of hydrogen or sanitas to prevent decomposition or with adrenalin and eucaine to diminish pain; and as to the efficacy of belladonna in controlling the secretion of mucus from lesions in the alimentary tract. Much may thus be done to lessen the sufferings of the patient, to retard death and to make life endurable, even if actual cure is as yet beyond our power.

A NATIONAL MEDICAL SERVICE.

IN a recent address before the Medico-Legal Society[1] Professor Benjamin Moore returns to an interesting subject that has a particular fascination for a certain proportion of the medical profession. His views on the desirability of converting the medical profession into a definite whole-time medical service, maintained by the State and free to every individual in the kingdom, were expounded by him in his "Dawn of the Health Age," in our review of which[2] we expressed the opinion that the condition of reform which Professor Moore holds to be necessary—viz., a radical and complete change in the whole aspect and outlook of the Government, the public, the private medical practitioner, and the health officer—will not be accepted by the medical profession as necessary in the least. So far we see no reason to change that opinion. To all mankind, save perhaps a few exceptional individuals, the value of gain over and beyond that necessary to maintain a comfortable existence lies in its utility for conferring a certain pre-eminence amongst one's fellows. To leave that out of account in respect of the wheel of life is like trying to eliminate the effect of zero from the roulette wheel.

[1] First Steps towards a State Medical Service. By Benjamin Moore, D.Sc., F.R.S. Liverpool: C. Tinling and Co., Limited. 1913. Pp. 28. Price 6d.

[2] THE LANCET, April 22nd, 1911, p. 1090.

Professor Moore evidently realises this fact when, in dealing with the initial stages of his proposed national medical service, he lays down as a principle that should first guide the authority which shall take over all the practitioners into the State Service, that each man's income should be fixed on the basis of the receipts of his practice for the past three years, striking an average, and adding an equitable amount for changed conditions of service and any increased work entailed by a more adequate attendance and the additional work of prevention, while in lieu of purchase value of a practice he would substitute a retiring pension at 65 years of age. But having thus solved the problem of "vested interests" in a summary way as regards the present, he proposes that for future generations of medical men there should be drafted "a fixed and graded scale of salaries at different periods of service," thus removing the most widely operative incentive to individual effort, the honours which are the reward of exceptional skill and ability in any field no less than of valour. The joys of military and naval life and comradeship, coupled with the distinction that has hitherto been accorded by common consent to "the services," are the makeweight which has up to now enabled the State to attract men of ability and character at a remuneration far below that which such men have a reasonable chance of attaining in other walks of life. Without that makeweight—and there is no indication that it could be imported into the proposed National Medical Service—would not men of exceptional ability tend to avoid medicine for other careers in which their individual capacities, in their own estimation at any rate, would stand a better chance of obtaining for them the coveted measure of pre-eminence? We repeat, however, what we said in discussing Professor Moore's former work, that none the less the ventilation of such views, leading as they do to thinking about the fundamental issues, serves good purpose.

THE EFFECT OF MALARIA ON THE COLONISATION OF PALESTINE.

ALTHOUGH at the present day less is heard of Zionist movements than was the case some years ago, a considerable Jewish immigration from European countries continues, not only into Jerusalem, but into various "colonies" in Palestine. Most efforts at the permanent settlement of Europeans in Palestine, however, have been marked by failure, the newcomers after a time sharing with the indigenous population a general want of energy and industry. While it is customary to attribute this to circumstances of race and climate, too little stress is laid upon the effect of prevalent disease, notably malaria. The extent to which the latter prevails is brought out by some striking observations contributed by Dr. E. W. G. Masterman, of Jerusalem, to the April number of the *Journal of Hygiene*. Since the establishment in Jerusalem, by some German societies, of a public health laboratory, under the direction of Professor Mühlens, of the Hamburg School of Tropical Medicine, it has been possible to make systematic examination of blood specimens and conduct other bacteriological work in coöperation with the medical men practising in Jerusalem. The children at some of the Jewish schools were examined during the autumn months, the period of greatest malaria prevalence, with the striking result that between 29 and 30 per cent. of those actually attending school were found to be infected with malaria. If the absentees had been counted the percentage would have been nearer 50. One such school at the time of investigation had one-third of its scholars away—mostly for "fever." Among 666 out- and in-patients of the English Mission Hospital, Jerusalem, whose blood was examined between Sept. 26th and the end of November, Professor Mühlens found 317 subtertian (tropical) malaria alone, 75 quartan, 55 tertian, and 13 double infections. Of the total cases 69·3 per cent. proved to have parasites, and of these 71 per cent. had tropical or subtertian malaria. As Dr. Masterman observes, this shows a terrible infection. Of the cases with gametocytes 116 were tropical (with crescents), 66 quartan, and 52 tertian. Many of the cases had their blood crammed with parasites. On consideration of the large proportion of persons specially liable to malaria (particularly young European children and old enfeebled European Jews just arrived with but little resistance to tropical disease), of the large percentage of gametocyte bearers, and of the abundance of anopheles in Jerusalem, the extent of the malaria is hardly surprising. The period of lowest prevalence is January to June, corresponding to the rainy period at the beginning of the year and the three months which follow it; then the prevalence rapidly rises and reaches a maximum in September, October, and November, to fall rapidly in December. Its distribution in Palestine is very wide. In the low-lying, maritime plain inland from Jaffa, Cæsarea, and Haifa many districts are very malarious; the Jordan valley, below sea level for two-thirds of its extent and descending to nearly 1300 feet below the Mediterranean at the Dead Sea shores, is so malarious that, in Dr. Masterman's view, much of it is no better suited for settlement by Europeans than the most unhealthy parts of tropical West Africa. Jerusalem stands 2500 feet above sea level in a dry, mountainous region, but its inhabitants obtain water from numberless tanks or "cisterns" where the anopheles even more readily than the culex delights to dwell. Whatever may be the difficulties of diminishing or eradicating malaria in the scattered villages and colonies of Palestine, it would obviously be practicable by sound administration to make a striking reduction in its prevalence in Jerusalem. Even if the local Turkish administration were induced to move, however, progress would be prevented by the "capitulations" under which all foreign subjects are practically independent of the local authority and accept no orders save through their own consuls. Thus we read that at present the inhabitants of a single Jewish tenement house may be representatives of perhaps half a dozen nations, and no public nuisance can be removed there without the assent of the consuls of all six powers. An international board of health, which is suggested, might supply the remedy if it were to be established with full powers, and put all measures for the prevention of malaria under the direction of a capable medical officer.

ACTIVE NITROGEN.

THE usual statement in the text-book that nitrogen is chemically inert will require modification in view of the beautiful experiments recently made by the Hon. R. J. Strutt. It would appear that under the influence of the electric discharge nitrogen assumes an active state in the same way possibly as oxygen does in the form of ozone. When a rapid stream of rarefied nitrogen gas passes through a tube in the interior of which the gas is sparked by a series of high-tension electric discharges from a Leyden jar, it subsequently issues as a brilliantly luminous jet, the stream of gas being visible as a whirling cloud of brilliant yellow light. Mr. Strutt's view of this phenomenon is that the discharge has split the nitrogen molecules into single atoms. "Nitrogen atoms in this condition are uneasy and are anxious to find partners again." This takes time, but the reunion of the nitrogen atoms is attended with the emission of a yellow light which continues so long as the process of pairing off is incomplete. The monatomic nitrogen so formed is, as might be expected, agreeable to

combining with other elements, whereas the nitrogen we have hitherto been familiar with is more or less disinclined for such union. In the text-books we are told that nitrogen is best characterised by negative properties. Mr. Strutt has already succeeded in showing that his monatomic nitrogen produced from ordinary nitrogen in the way indicated will combine with the carbon of acetylene or chloroform and produce cyanogen compounds. Prussic acid may thus be produced directly from the simple elements, hydrogen, carbon, and nitrogen. With mercury an explosive compound is obtained. The discovery brings many suggestions to the mind as to the possibilities of its practical application. The direct preparation of ammonia from the air, for example, may possibly be accomplished economically in this way, since ammonia is of course a simple compound of nitrogen and hydrogen. It is further interesting to consider whether monatomic nitrogen plays conceivably a part in the formation of protein in plant life. We know that in certain cases bacterial agencies are concerned in handing over the nitrogen of the air to the plant for the purpose of its nutrition. In this mission it may be that these agencies render nitrogen assimilable by converting ordinary inert nitrogen into the monatomic or active variety. If there were anything in such a suggestion Mr. Strutt's discovery would throw an extraordinary light upon the great building processes of Nature, in which the nitrogenous substances are fashioned from the sea of nitrogen enveloping us.

ROMAN MEDICINE IN EPIGRAPHY.

THE new departure just taken by the University of Manchester in reinforcing its Latin chair by another in which epigraphy, or the literature of inscriptions, mainly sepulchral, is to receive special study, coincides with the enhanced interest awakened in that branch of philological and antiquarian research. In Italy especially the rapidly accumulating accessions to epitaphial literature are attracting students in ever greater numbers, British, Transatlantic, and Continental; and the light thus thrown on the civilisation of the Latin world, illuminating as it has already proved, will, before the century is much older, place in yet fuller and more impressive relief the daily life of the Roman citizen, urban and provincial, clearing up many of its obscurer recesses and conducing to a juster appreciation of the public as well as private conditions under which the said citizen lived and died. In a very scholarly paper read before the British and American Archæological Society of Rome, and just published in its journal, Dr. Tracy Peck, emeritus professor of Latin in Yale University, dwells on the thousand sepulchral inscriptions referring to the professional or business man contained in the sixth volume of the "Corpus Inscriptionum," or brought to light since its publication in 1882. Out of that thousand, no fewer than 230 callings or trades come into view—a number readily to be realised when we find how multifarious were the requirements and, consequently, how numerous was the retinue, of officers of State under the Empire—a fiscal agent in Lyons, for example, who died in Rome on a visit to the Emperor Tiberius, having in his train three secretaries, a physician, a master of the wardrobe, a treasurer, two chamberlains, a steward, two footmen, two custodians of the silver plate, and, apparently, a concubine. The medical calling numbers as many as 60 representatives among the 230 referred to, and these include not only the consultant and the general practitioner, but the oculist, the veterinary surgeon, the "aliptes" or anointer, and other such specialists. The elder Cato, imbued with the prejudice, not unknown in our day, against the practitioner from abroad, warns his son to keep at arm's length all "Greek doctors," but, in spite of the "boycott" thus inspired, the interloper from Hellas became ever more in evidence, till more than half the 60 medical men alluded to hailed from that country or bore such typical Greek names as Alexander, Philomusus, Heracles, and Menander. For more than six centuries, as we know from Pliny the Elder, Rome "was without doctors," though not without medicine; that the Peloponnesian Archagathus was the first physician recognised as such in the city; that on his arrival he was so highly esteemed as to be honoured with the right of citizenship and an official post at the expense of the State, but that his frequent resort to the knife earned him and his imitators the name of "carnifex" (butcher). Those, however, were the days of increasing luxury and dread of pain, few Romans having the pluck of the plebeian consul Marius, who bore without wincing a whole series of operations on his varicose veins. Pliny is further our informant as to the princely fees or "honoraria" earned by physicians in high practice—many of them amassing from their incomes the means of purchasing their freedom and of enriching their respective communities with benefactions. Such was the case, as Professor Peck tells us, with Eros Merula, a Greek physician, according to an inscription immured in the Temple of Minerva at Assisi. Dentistry, we find, was early practised as a profession in Rome—false teeth, crown-filling, and gold plates having been in use not in Rome only but in Italy several centuries before Christ. Indeed, we know from the Twelve Tables that, to check extravagance at funerals, it was made illegal to burn or to bury gold with the dead, "unless the gold was attached to the teeth." As to the apothecary, our information, according to Professor Peck, is still to seek, though Cicero (he reminds us) mentions a druggist who disposed of his wares from one rendezvous to another, as a "pharmacopola circumforaneus." But we are as yet on the threshold of further insight into the professional life of antiquity, and it is to such new departures in academic equipment as that taken by Manchester that we must look for the studies, extensive and intensive, by which the veil will yet be lifted from the *vie intime* of the pagan world.

THE NEEDS OF THE TUBERCULOSIS OFFICER.

NEW conditions create new requirements. The great awakening that has taken place in regard to the possibility, and therefore the duty, of stamping out tuberculosis has for some time focused not only professional but lay attention on the necessity for organised schemes for coördinating the various agencies at work in the war on tuberculosis. But with the advent of the National Insurance Act a new condition has arisen in the creation of special tuberculosis officers; and it is obvious that if an adequate supply of properly trained candidates is to be forthcoming means of training them must be provided. Professor Sheridan Delépine directs attention in the *British Journal of Tuberculosis* to the need for post-graduate teaching in tuberculosis. He points out that the kind of instruction especially required by the tuberculosis officer is not suitable for young students, whose first aim should be to make themselves familiar with well ascertained facts and theories bearing generally on the practice of medicine and surgery: whereas what the tuberculosis officer needs is to have placed before him trustworthy accounts of the facts concerning tuberculosis at present known; to familiarise himself by practical studies with the methods by which he can investigate critically the value of the various "new discoveries" which are continually announced; and to be able to estimate aright the soundness of the methods he has himself used or observed others using in regard to the diagnosis and treatment of the disease. But, as Professor Delépine further points out, it is unfair to demand

that the expense of this special training shall be placed upon men who have already devoted five or six years to the general study of their profession; and he therefore makes the suggestion that the men selected for these posts as being generally well informed, skilful, and qualified for the discharge of responsible medical duties should be allowed to devote the first year after their appointment to the study of the special pathological, administrative, and clinical work required. Suggestions as to the suitable training of tuberculosis officers have already been made to the Local Government Board by the representatives of the hospitals for diseases of the chest in London, but the reply has been anything but encouraging.

SCIENTIFIC RESEARCH FOR THE LOCAL GOVERNMENT BOARD.

THE President of the Local Government Board has authorised the following special researches to be paid for out of the annual grant voted by Parliament in aid of scientific investigations concerning the causes and processes of disease:—

1. A continuation of the Board's inquiry into the Causes of Premature Arterial Degeneration, by Dr. F. W. Andrewes.
2. A continuation of the Board's inquiries on Insects in Relation to Disease: Professor Nuttall, F.R.S., on the Life Cycle of the Body Louse and Bug; Dr. Bernstein and Mr. Hesse on the Empusa Muscæ in Flies.
3. A continuation of the Board's inquiry into Infantile Diarrhœa, by Mr. F. W. Twort and Dr. Edward Mellanby.
4. A continuation of the Board's inquiry into the Virus of Poliomyelitis, by Dr. Andrewes and Dr. M. H. Gordon.
5. An investigation by Mr. F. W. Twort into the Character and Life-history of certain Filter-passing Micro-organisms.
6. An investigation by Professor Leonard Hill, F.R.S., on Respiratory Exchange in Man under Varying Conditions.
7. An investigation by Mr. J. E. R. McDonagh on the Biochemistry of Syphilis.
8. An investigation by Dr. L. Rajchman into the Possibilities of Serological Diagnosis of Scarlet Fever.
9. An investigation by Dr. D. M. Alexander on the Relation between the Clinical Symptoms and the Bacteriology of the Acute Respiratory Affections.

THE LYMPHOCYTOSIS OF INFECTION.

IN the acute stage of the great majority of infectious diseases there is polynuclear leucocytosis. In a few, such as typhoid fever and malaria, there is no marked change in the number of leucocytes. Occasionally infections associated with polynuclear leucocytosis show instead lymphocytosis. This phenomenon is most striking in whooping-cough, where it is so constant that some writers have regarded it as of value in differential diagnosis. In the *American Journal of the Medical Sciences* for March Dr. Richard C. Cabot has called attention to the danger of confounding infections associated with lymphocytosis with lymphatic leukæmia and giving an alarming prognosis. He has observed a group of cases in which infection, usually streptococcic, was associated with lymphocytosis. In one case a medical man infected his finger near the nail at a necropsy. Lymphangitis with enlargement of the axillary glands on the same side, and, to a less extent, on the opposite side, followed. For several weeks there was fever somewhat resembling typhoid fever. Throughout well-marked absolute and relative lymphocytosis was present, so that several consultants were alarmed as to the possibility of lymphatic leukæmia. Slow but complete recovery ensued. In a second case an undergraduate, aged 20 years, was seen on Nov. 15th, 1909, for boils which had persisted for six weeks. At the time of onset he was considerably run down. His temperature ranged from 100° F. in the morning to 102° in the evening. The leucocytes numbered 3400 per cubic millimetre, of which 82 per cent. were lymphocytes of various types. On the 19th the leucocytes numbered 16,400, of which 86 per cent. were lymphocytes. By Dec. 1st he was quite well. In the third case a girl, aged 20 years, in the middle of an epidemic of streptococcic sore throats during January, 1912, began to suffer from morning headache. A week later the right axillary glands became enlarged. A week still later, on Feb. 3rd, she began to suffer from severe sore-throat with a temperature of 102°, which lasted about four days and was accompanied by swellings on each side of the neck. During the following two weeks she had frequent night-sweats. The fever ceased, but she continued to lose weight and strength. On Feb. 16th the cervical glands, both lateral and posterior, were enlarged to the size of marbles; in the right axilla was a gland of the size of a small hen's egg and there were smaller ones in the left axilla. The inguinal glands were also enlarged. The percussion note at both apices, especially the right, was dull. The leucocytes numbered 9000, of which 71 per cent. were lymphocytes. On the 23rd the fever had ceased and the glands were smaller but still abnormal. The leucocytes numbered 3600, of which 62 per cent. were lymphocytes. After this recovery was uninterrupted. In a fourth case, a man, aged 37 years, had a "cold" in February, 1912, which left him with a cough that continued during March. On the 18th he awoke with the glands of the left side of the neck sore and swollen. After three days they subsided, but he began to have fever, and on the 22nd the temperature was 101°. For the next ten days he was in bed with slight evening fever and night sweats. On the 28th the leucocytes numbered 30,500, of which 67 per cent. were large lymphocytes and 8 per cent. small. The number of leucocytes gradually declined till May 11th, when they numbered 18,000, of which 7 per cent. were large and 35 per cent. small lymphocytes. On the 23rd the number was 8200, of which 4 per cent. were large and 38 per cent. small lymphocytes. Recovery after this was uneventful. In the differential diagnosis between streptococcic or tuberculous adenitis and lymphoid leukæmia the important points are the evidence of a cause of the adenitis, the course of the disease, and the percentage of lymphocytes in the differential count. Although this was elevated in the cases reported above, it was considerably lower than in lymphoid leukæmia at the period when patients are sufficiently ill to seek advice. In the latter disease there is usually over 90 per cent. of lymphocytes, and many of them are broken down. It should be noted that acute lymphoid leukæmia often begins with symptoms of sore-throat, like those described in the third case. These are due to leukæmic infiltration of the tonsillar ring.

RUPTURE OF AN ABDOMINAL HYDATID CYST DURING EXAMINATION.

RUPTURE of an abdominal cyst during examination is a rare accident. In the *Australian Medical Journal* of March 29th Mr. G. F. Hagenauer has reported the following case. A girl, aged 16 years, complained of dragging pains in the lower abdomen, and gave a history of 5½ months amenorrhœa and occasional vomiting. On examination a tumour was found above the pubes rising out of the pelvis and corresponding in size to a five months' pregnancy. The diagnosis lay between pregnancy and an ovarian cyst. She was examined under an anæsthetic and the uterus was found not to be enlarged. The tumour was cystic and well defined. On an attempt being made to elevate it out of the pelvis its outline was suddenly lost and the tumour disappeared. As there was no doubt that the tumour had ruptured the patient was removed to hospital in a collapsed state. The abdomen was opened above the pelvis and found to contain a great deal of clear fluid. The omentum and coils of small intestine were much matted together by adhesions. In the omentum was found a ruptured hydatid cyst, which was removed. The abdomen was swabbed out as much as possible and closed. The wound

healed well and good recovery ensued. Owing to the adhesions the cyst had been so fixed as to simulate a pregnant uterus or an ovarian cyst.

A SIGN OF ACUTE PANCREATITIS.

ACUTE pancreatitis is difficult of diagnosis and often discovered only on operation. In the *Australasian Medical Gazette* of March 29th Dr. C. E. Todd, who has had a good many cases under his care at the Adelaide Hospital in the last few years, has called attention to a sign which previously appears to have escaped observation—absolute dulness in both flanks unaltered by any change of posture. In all his cases the patients were sent in with the provisional diagnosis of intestinal obstruction, and this sign was present. It is due to a collection of partially digested blood in both kidney pouches. Dr. Todd describes the sign as "not ordinary dulness, but a dulness so absolute that it can be 'felt.'"

THE PULSE-RATE AND ARTERIAL TENSION IN THE NEW-BORN INFANT.

A SATISFACTORY study of the blood pressure in the newly born infant has hitherto been prevented by the impossibility of using most of the usual apparatus with anything like scientific accuracy. Different observers, using sphygmomanometers of the Riva-Rocci type, have attained widely divergent results, probably because it is difficult to tell by tactile sense alone at what point the radial pulse actually disappears. The infant's arm is so soft and the artery so small that it is often quite difficult enough to feel the pulse at all. For these reasons there is a good deal to be said for the claim which M. Balard, of Bordeaux, puts forward in his communication to the *Gazette des Hôpitaux* of May 8th, to the effect that the introduction of oscillometry into clinical medicine puts accurate information as to the arterial pressure of infancy within reach of the clinician for the first time. The Pachon oscillometer, a modification of which has been used by M. Balard in researches on 40 infants, has this great advantage, that it registers automatically the disappearance of the pulse beneath the pressure of the inflated armlet, so that the personal equation is apparently excluded altogether. In adults it has been found that readings are in general higher with this instrument than with apparatus of the Riva-Rocci type, and that the higher the pressure the wider is the divergence. It is, of course, impossible to find out whether this holds good of infants also, owing to the variability of the Riva-Rocci readings in infancy; at any rate, M. Balard makes no statement on this point. With regard to the pulse-rate he finds that it falls during the first six hours of the first day of extra-uterine life from about 150 to about 100 per minute; this is to be ascribed to a closely parallel drop in the temperature which occurs during the same period. From the second day onwards the pulse reaches and maintains a rate of about 150 per minute, a little more or a little less. The blood pressure, on the other hand, is not in the least affected by the initial fall of temperature. At birth it lies between 35 and 55 millimetres of mercury, and does not apparently vary with the infant's weight. From this time onwards the maximum or systolic pressure and the minimum or diastolic pressure increase steadily and in parallel, the difference between the two—the pulse pressure—remaining approximately constant. M. Balard has found it impossible to estimate the effect of respiration and of digestion on the blood pressure owing to the rapidity and short duration of these processes in the infant. Certain facts have, however, been elicited as to the effects of sleep, rest, and suckling. The diastolic pressure rises little, if at all, with waking or at the breast; the systolic pressure, on the other hand, always rises appreciably in both cases, often by as much as 15 millimetres. Waking increases the rate of the pulse but slightly, but it is quickened by 15 or 20 beats per minute by the process of suckling. M. Balard suggests that deviations from these averages of variation with activity may be of importance through the light thrown by them on underlying pathological states; but this of course requires exhaustive investigation, and apart from research it is scarcely likely that oscillometry will ever be applied in a general way to the examination of the new born infant.

IN-PATIENT ACCOMMODATION AT GUY'S HOSPITAL.

A COMMITTEE of King Edward's Hospital Fund for London has considered the allegations of the Southwark board of guardians against the authorities at Guy's Hospital that patients in a dying condition had been refused admission at the hospital and had been sent to the infirmary and workhouses under the control of the guardians. The Distribution Committee, who held the inquiry, state in their report that they had before them a summary of the cases upon which the complaints were founded which had been previously considered by the Fund. Among these were three cases reported by the guardians in 1903, one case in 1905, when the Fund expressed itself satisfied with the explanation of Guy's Hospital; and two cases in November, 1911. The committee state that the old question was raised of the reference from Guy's Hospital to the guardians of cases for which there is no room, or which they consider more suitable for the Poor-law infirmary than for the hospital. The explanation of Guy's Hospital is that their beds are limited, so that they cannot take in all kinds of cases, or even all urgent cases; that it is the duty of the guardians to provide for the sick poor for whom there is no accommodation in the hospitals; and that the difficulty in urgent cases arises because the Southwark infirmary is four miles off, and the guardians will not provide an emergency receiving house. The guardians argue that their duties are confined to the "necessitous poor"; that Guy's Hospital ought to take in all cases above that class and particularly urgent cases; that the workhouses and infirmary already provide adequately for the local necessitous poor; and that to provide a receiving house would encourage the hospital to send cases belonging to other unions. The Distribution Committee reported in 1911 that they considered it desirable that additional provision should be made at Guy's Hospital for emergency cases, especially at night; and they adhere to that view. They suggested at the time that two or more surgery beds might be kept free every night for emergencies. To this the hospital authorities replied that until they were in a position to build new accident wards and a new casualty department they could not make better arrangements. The hospital authorities now state that the scheme of extension upon which they are at present engaged will, when completed some years hence, afford space for a female accident ward, if funds for its upkeep are then available. The Distribution Committee consider, however, that as the infirmary is so far away, the guardians ought to establish a reception station in the neighbourhood, where it is required, since they have the power to do so. The committee think it would be absolutely wrong for the hospital to overcrowd its surgical wards with emergency cases, the same observation applying, though not so strongly, to the medical wards. In their opinion a voluntary hospital should not be expected to admit incurable cases. The fact that Guy's Hospital attracts patients resident outside the union, who subsequently become chargeable to the Southwark union, is no reflection

on the institution, the guardians having their own remedy by discovering the legal settlement of such persons and making them chargeable accordingly. The guardians have decided to take no action with reference to the suggestion of the Distribution Committee that they should provide an emergency reception station. This decision may have been influenced by the fact that large clearance schemes have been carried out in the immediate vicinity of Guy's Hospital, resulting in a diminution in the number of the sick poor in the neighbourhood. We congratulate the sorely tried authorities of Guy's Hospital upon the gist of the candid report of the committee.

A REPORT on Tuberculin Tests, by Dr. L. Cobbett and Dr. A. Stanley Griffith, has been issued this week by H.M. Stationery Office as a supplemental volume to the Appendix to the Final Report of the Royal Commission appointed to inquire into the Relations of Human and Animal Tuberculosis.

THE honorary treasurer of the Imperial Cancer Research Fund has received a donation of £10,000 from Mr. Edwin Tate towards the endowment of the research.

MAN'S MENTAL EVOLUTION, PAST AND FUTURE.

BY HARRY CAMPBELL, M.D., B.S. LOND., F.R.C.P. LOND.,
PHYSICIAN TO THE WEST END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM.

(*Concluded from page 1410.*)

IV.[1]

2.—*Inter-tribal Warfare.*

IN order to understand the effect of inter-tribal warfare on mental evolution we must first inquire into the agencies at work among primitive communities in keeping down the population. We shall find that some of these agencies are non-selective as regards the mental side of man, while others, among which warfare takes the chief place, are mentally selective and help to promote mental evolution.

The population of a country is mainly determined by its available food-supply. It may reach the maximum which that supply can support, but obviously it cannot exceed it. By *available* supply I do not, of course, mean *potential* supply, but the actual supply available to a people living in a certain stage of culture. The actual supply of Australia before the advent of the white man was small, for the aborigines neither cultivated the soil nor bred animals for food; but it is probable that they obtained the maximum which in their particular phase of culture it was possible for them to extract from their country, and that they had thus reached the limit of their numbers. This limit was probably attained thousands of years ago, since which time we must suppose the population to have remained stationary. It seems, indeed, likely that, once man had spread over the habitable globe, the total population of the world remained at much the same level until the termination of the pre-cibicultural period. Some increase no doubt took place with the discovery of cookery, leading as this did to an increase in the supply of vegetable food. But even so, it is probable that the world's population at the end of the pre-cibicultural period did not exceed a few millions.

While it is probable that the pre-cibiculturists drew upon the whole of their available food-supply—obtained all that it was possible to obtain with the means at their disposal—this is by no means always the case with the early cibiculturists. Assuredly it is not the case with the aboriginal negro population of Africa. These people are greatly in advance of the Australian aborigines; as cultivators of the soil and breeders of animals their food-supply admits of easy increase, and there can be no doubt that their numbers are considerably below the maximum which their available supply admits of, though presumably greater than before the introduction of agriculture and the artificial breeding of animals for food. As in the case of the pre-cibiculturists, and probably indeed of all primitive communities, the negro population of Africa is practically stationary, except in so far as it is fostered by the presence of the white man.

Now, since there is no reason to believe that there is any substantial difference between the reproductive powers of civilised and of pre-civilised man, each tending to increase in geometrical ratio, it follows that the agencies restricting the population must be more stringent in the pre-civilised than in growing civilised communities. Consider the case of a stationary pre-cibiculturist population, such as comparatively recently existed in Australia. Assuming the average number of children born to each woman to be four, then in order that the population should not increase, one half of them would need to be eliminated, while with an average of six children two-thirds would need elimination.

There are two ways in which population may be kept down—by a low birth-rate or by a high mortality. Some primitive communities deliberately restrict the population by curtailing the births and by infanticide. These deliberate methods, implying as they do foresight, can only have been adopted at a late period in man's evolution.[2] Observe that they are both non-selective. Neither the children prevented from being born, nor those deliberately destroyed after birth, belong to special types, and their elimination cannot therefore have influenced evolution either on the physical or on the mental side. Neglecting these comparatively recent eliminative agencies, the chief agencies by which the population of primitive communities has been kept at its fixed level are: (*a*) disease, (*b*) starvation, (*c*) accident, and (*d*) fighting.

(*a*) The mortality from disease among pre-cibiculturists must have been far less than it is with civilised man. Their wandering open-air life exempted them from the epidemics which devastate civilised communities. Such deaths as were due to disease, though selective as regards the physical side, were not selective as regards the mental. Disease did not eliminate any special mental type except in the case of downright insanity.

(*b*) I do not believe that starvation was directly responsible for more than a small proportion of deaths, for reasons which will presently appear.

(*c*) The mortality from accident, again, was probably small. Fatal accidents doubtless occurred, chiefly, no doubt, in connexion with hunting, but such deaths were not, perhaps, in any decided degree selective. The least wary, and possibly also the most courageous, would be the most liable to be eliminated from this cause.

(*d*) Throughout the entire tribal period of man's career fighting probably constituted the principal means by which the population was restricted, and its effect, as I shall argue, was to advance man's mental evolution. Fighting may consist in single combat, or it may be inter-tribal. The mortality in the former case is comparatively small, and it is not easy to determine its influence on mental evolution; victory in this mode of fighting, though helped by courage and skill, is in large measure dependent upon mere brute strength. In the case of inter-tribal warfare, on the other hand, not only is the mortality high, but it tends to result in the survival of the most gifted tribes. It is a mentally selective eliminating agency. Now, seeing that among the pre-cibiculturists population was stationary, and elimination consequently very stringent, we must conclude that this mode of warfare was a potent agent in advancing mental evolution. Directly, however, man began to employ deliberate means of limiting the population, whether by a curtailment of the number of births or by infanticide (means which are non-selective), inter-tribal warfare (which is selective), being no longer so urgently called for, became automatically less and mental evolution was to that extent impeded. We are thus led to ask whether the comparatively low mental level of certain pre-cibiculturists—e.g., the surviving aboriginal Australians—may not be due to the fact that at a comparatively early stage of their mental evolution they began deliberately to restrict their numbers.[3]

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[1] Articles I., II., and III. were published in THE LANCET of May 3rd (p. 1260), 10th (p. 1333), and 17th (p. 1408), 1913, respectively.

[2] The pre-cibicultural Australians appear to have aimed at reducing the birth-rate by their custom of urethral incision. This, however, has been denied. It is stated that the practice does not diminish fertility.

[3] I find that infanticide is largely practised by these people. This, and the further fact that inter-tribal warfare is not a potent eliminative factor with them, lends colour to the suggestion I have thrown out.

Causes of inter-tribal warfare.—These are two: (*a*) The limitation of the food-supply, which, when artificial means are not taken to restrict the population, renders warfare a logical necessity; and (*b*) the fighting instinct.

(*a*) In the case of those primitive communities of which the population is at, or near, the maximum which their country can support, the competition for food must be keen. Such was probably the case with the pre-cibicultural Australians before the advent of the white man. Pre-cibicultural man is a wanderer without any fixed abode. Each tribe, or group of tribes, has its own territory and visits now this, now that, portion of it, according as game or vegetable food is plentiful. One would, therefore, expect disputes concerning the right to certain preserves to be a potent *casus belli*. If no precautions are taken to restrict the population, and if disease and starvation do not reduce it to the necessary proportions, war becomes an essential. But disease and starvation are not of themselves sufficient for the purpose. Disease most certainly is not; starvation would be *if it were allowed to proceed unchecked*, but this very starvation, or the fear of it, incites to war. It would therefore appear that inter-tribal warfare, which thus helps to reduce the population to limits compatible with the food-supply, is of the nature of a normal, because a necessary, phenomenon.

(*b*) This form of warfare has, however, other causes than starvation, or the fear of it, causes which appear to be redundant, such as vengeance, ambition, or the mere lust of fighting. Doubtless among pre-cibiculturists such incentives to warfare have had their share in keeping the population within the necessary limits. Whether among such communities they reduce it distinctly below the maximum consistent with the food-supply, it is not possible with the data at our command to say. This much, however, seems certain—that with early agricultural communities, such as the negro aborigines of Africa, with whom the struggle for food is less insistent than with the pre-cibiculturists, these later causes of warfare become increasingly effective, and lead to so much fighting that the population may fall considerably below the possible maximum.

Man as a fighter.—In common with all other vertebrates man is endowed with the fighting instinct. He, indeed, stands supreme in this respect. Not only does he wage incessant warfare on other species, destroying infinitely more of them than any other vertebrate, but of all vertebrates none fights so systematically as he with members of the same species. Among other vertebrates, except in the struggle among rival males for the possession of the female, there is comparatively little intra-speciem fighting; whether gregarious or otherwise, members of the same species live in comparative harmony with one another. The evolving man, on the other hand, from the moment that he could handle a weapon, if not before, was an incessant fighter.

The invention of hunting weapons and the institution of tribal life must have given a great stimulus to warfare. It is probable that by the time man had become a skilled hunter of large game, tribal life and the inevitable inter-tribal warfare had begun. The fighting between men now came to be the most terrible the world had yet known. No longer a fight, prompted by blind instinct, with natural weapons (teeth, claws, horns, and the like), and in which victory was generally to the physically strongest, it became a fight with hand-made weapons, wielded warily and with deliberation, a fight in which intelligence played a part such as it had never played before, for it was intelligence which fashioned the weapons, which directed the use of them, which planned the organised attack—above all, it was intelligence, in the case of inter-tribal warfare at least, which determined victory. It is true that the success of one tribe over another may not infrequently have been due to chance circumstances rather than to superior mental endowment, yet on the average victory assuredly has fallen to the most gifted tribes, not merely to the most courageous, but to the best organised, the best disciplined, the most skilfully led.

It is important to observe that in inter-tribal warfare the death-roll is heavier on the side of the conquered than of the conquerors. In this respect modern civilised warfare and inter-tribal warfare stand in sharp contrast. When two civilised nations war with one another the percentage mortality for each entire nation—not the mere fighting portion of it—is much the same and is small; the war has little or no ultimate effect numerically upon the population of either nation, and so far as it affects evolution it is on the physical side, and that in a downward direction, since it leads to the destruction of some of the best physical types. The first Napoleon is said to have taken two inches off the stature of the French nation.

How different the effects of inter-tribal warfare! Not only do all, or practically all, the men of the tribe take part in the fight, but the percentage loss of the vanquished is generally much greater than that of the conquerors. Defeat may, indeed, mean the practical annihilation of the vanquished, if not after a single battle at any rate after a process of guerilla warfare extending over months, or it may be years. Take the history of the African aborigines. It is one long tale of war. Within the memory of living men whole tribes, nay, whole groups of tribes, have been wiped out. There is no stability with them, but a ceaseless rise and fall of one power after another. Picture this kind of thing going on from the very dawn of tribal organisation, and we get some idea of the part inter-tribal warfare has played in advancing man's mental evolution, for who can doubt that the most gifted tribes have in the main been victorious?

This ceaseless destruction of inferior by superior tribes has not only led to a steady mental ascent, it has had the farther effect of keeping all those tribes which are in touch with one another on much the same mental level. Thus the entire aboriginal population of Australia (on the first arrival of the white man), and the entire negro population of Africa, are each respectively on much the same mental plane, but the latter has reached a higher level than the former. Only under conditions of prolonged isolation would it be possible for one portion of the human race to lag far behind the rest. If the Homo-Javanensis, who had barely reached the tenth stage, co-existed with man at the fifteenth stage, he must have remained for an enormous period of time isolated from his fellows. Imagine what would happen if a race of tenth-grade humans were brought into prolonged contact with a race of fifteenth-grade humans. We know from what is happening in our own times. The Australian aborigines, whose mental level is but little lower than that of the white man, are being rapidly exterminated by him, just as happened in the case of the Tasmanians.

3.—*Factors Influencing the Evolution of the Feelings.*

The three factors in mental evolution already considered—the struggle for animal food (culminating in skilled hunting), polygamy, and inter-tribal warfare—have operated both on the feeling[4] and the intellectual side of mind. Thus as regards the feelings, the life of the hunter engendered a spirit of adventure and daring, for those excelling in these respects stood the best chance of survival. Those again who secured the most wives and thus got the most children, were not only the most intelligent but the most courageous, self-assured, and pertinacious. And the like is true of those constituting the conquering tribes. But the main effect of these factors has been to promote the evolution of the intellect: it has been through them that the evolving human has been raised from the intellectual level of the ape to that of modern man.

The factors we have now to consider have operated chiefly on the affective side of mind.

(*a*) Foremost among them have been the obligations and restrictions of communal life. The effect of these has been to strengthen inhibitory power and to evolve a disposition to act in accordance with social codes, for in general those who have been unable to conform have stood the least chance of survival. Now, conduct is largely determined by feelings, and the innate disposition to act in certain ways depends upon inherited feeling; whether a person is by nature social or anti-social, whether he is naturally inclined to good or to evil, depends upon his innate feelings, not upon his intellect. Hence social life, so far as it imposes obligations and restrictions, has led to an evolution in the realm of feeling rather than of intellect.

(*b*) A second factor, worthy of special mention as influencing the affective side of mind, is that division of

[4] I use the term "feeling" here not in the sense that modern psychologists attach to it, but to embrace both the sensations and the emotions.

labour among the pre-cibiculturists which imposed on the woman the heavy task of gathering and preparing the vegetable food. This by natural selection has evolved a disposition to industriousness and perseverance.

(*c*) A third factor is motherhood. To this the evolution of the altruistic disposition is traceable.

(a) The Influence of Social Codes on Mental Evolution.

Directly the evolving humans began to band themselves together into communities it became necessary to observe rules of conduct. Without some such rules the simplest community could not hang together. The obligations and restrictions thus imposed, whether they simply took the shape of customs enforced by public opinion, or were, as later, deliberately framed laws, have had a profound influence on the affective side of mind, for, on the whole, those most amenable to them have stood the best chance of survival: there has been a ruthless elimination of the unruly and anti-social. Thus there has evolved an amenability to disciplinary influences and a disposition to observe social obligations—i.e., to act morally. This disposition depends upon that subtly compounded feeling which constitutes the basis of conscience, a disposition which is essentially adaptive, as much the product of natural selection as the most elemental instinct.

Recent anthropological research has shown that from an early period of his career man has been subject to rigid discipline. Nothing could be further from the truth than the popular conception of the savage as a wild, irresponsible semi-maniac, the sport of every passing impulse. It is even doubtful whether in the matter of cruelty he is much worse than the civilised man. Nothing in savage life could well exceed the cruelties practised in Europe during the Middle Ages.

From the very beginning of communal life some rules of conduct had to be enforced, and with its development these became increasingly complex and insistent, ultimately (as, to cite them again, in the case of the Australian aborigines) assuming a truly bewildering complexity. Indeed, the normal savage [5] is subjected to far stricter discipline than the average members of civilised communities, to say nothing of spoilt children and street urchins. While with the generality of savage peoples childhood is an irresponsible time of play, the boys as they approach manhood are instructed in the secret laws of the tribe and initiated into its mysteries with strange and impressive ceremonies, and the serious business of life begins: the youth becomes a warrior and hunter in earnest, and if he fails to conform strictly to the tribal code it may be at the imminent risk of his life.

The women, though kept in entire ignorance of the secret tribal code, are nevertheless compelled to conform to the overt customs of the tribe and to adapt themselves to the men, who on the principle that might is right are their natural masters. It is probable that some of the mental characteristics of the woman are due to this fact: guile has had to be pitted against muscle. Natural selection has doubtless helped in the evolution of these characteristics, for, in general, the women best able to adapt themselves to the vagaries of their menfolk have stood the best chance of survival. So successfully has natural selection equipped the woman with means to cope with the more powerful man that, in spite of gruesome stories to the contrary, one can well believe that the savage woman is quite as able to take care of herself and to hold her own against the man as the civilised—and this perhaps is saying a good deal.

Among civilised communities the obligations and restrictions placed upon conduct are far more numerous and subtle than among the pre-civilised, and adjustment to them is correspondingly difficult. Opportunities for breach of right conduct abound in every direction, and many, especially during the earlier years of life, have to run the gauntlet of perpetual temptation. Happy he, and rare as happy, who comes through the ordeal unscathed. Among civilised, much more than among pre-civilised, communities it is character that tells: honesty, industry, temperance in all things—these are the things that count. On the whole, those most richly endowed in these respects have stood the best chance of survival. The extent to which elimination has occurred of those who fail to adapt themselves to the manifold temptations and restrictions arising out of our complex civilisation is not adequately realised. The dishonest, the idle, the debauched, to say nothing of the baser anti-social types, have from the first dawn of civilisation stood less chance of survival than their opposites. Natural selection has been industriously at work among them. It was not so very long ago that such a minor offence as sheep stealing was punishable by death, and in the reign of Queen Elizabeth no less than 50,000 people are said to have perished by the axe. Thus the evolution of a law-abiding disposition, which had been steadily proceeding throughout the long period of man's tribal career, has continued with increased vigour during the civilised era.

I do not say that *all* the influences among civilised communities tend to secure the survival of the best moral types. With them there have been, and still are, influences at work in the opposite direction. Galton has pointed out how in the Middle Ages thousands of the finest and gentlest natures sought the peace and protection of the monastery and the convent, to the grievous loss of the race. Religious persecution, again, has not infrequently led to the elimination of those whose very strength of character and earnestness of purpose have marked them out for destruction. It is further probable that some of the best types fail to marry by reason of the very virtue which is in them.

A striking example of the influence of peculiar social conditions upon mental evolution is afforded by the Jews. Though it is probable that even before the Christian era these people were endowed with a peculiar mental temperament, it can hardly be doubted that this has been emphasised by the persecution to which they have been exposed during the past 2000 years. The result has been the survival of those who by their mental equipment have been best able to evade and resist the forces directed against them.

(b) The Industriousness of the Pre-cibicultural Woman.

Among all pre-cibiculturists (save the Esquimaux), as well as among cibicultural savages, a peculiar division of labour obtains. While the men devote themselves to hunting and fishing, to the women falls the task of gathering and preparing the vegetable food. Now each of these pursuits—that of providing the animal and that of providing the vegetable food—entails persistent effort: that of the woman in particular involves steady, patient toil. Here again the popular conception of the savage is at fault: he *does not* fill up such times as he is not engaged in desultory hunting, or fighting, or belabouring his women-kind, by basking in the sun, eating luscious fruits which drop unasked into his mouth. The primitive savage, notably the woman, has to work hard to provide the daily provender. It is thus altogether a mistake to suppose that steady plodding work only began with civilisation. The primitive woman has to spend the greater part of her day in hard, tedious labour.[6] This life of toil, continued from generation to generation through tens of thousands of years, cannot fail to have left its mark on mental evolution: natural selection must have tended to eliminate those incapable of adapting themselves to it.

(c) Influence of Motherhood on Mental Evolution.

Drummond has drawn attention to the influence of motherhood in developing the altruistic, or the "other-regarding" disposition. It is now generally admitted that the maternal instinct is the source of the altruistic disposition, the disposition of the individual to concern himself with the welfare and happiness of others besides himself. Drummond rightly lays stress upon the prolonged stage of helplessness of the young human and the unremitting care the human mother has to bestow upon the child during it. Failure in this respect would lessen the child's chance of survival, and thus by natural selection the disposition to sacrifice self evolved, and, extending to others besides the offspring, has come to manifest itself as an all-round altruistic bent. A further essential to the successful rearing of children is that the men, whether recognising their fatherhood or not, shall be tenderly disposed toward the children. Without some sort of sympathetic coöperation on the part of the men with the mothers the survival of the children would be jeopardised.

[5] I take it that tribal life is the normal condition of the savage, for from its first inception those who failed to adopt it ran great risk of extinction. It is true that irregular bands, devoid of definite organisation, are occasionally met with, but such are to be regarded as degenerate offshoots of definitely organised (normal) tribes, doomed sooner or later to be wiped out.

[6] This association of women with the provision of vegetable food has continued through the early agricultural period right down to the present time; in most European countries except our own the women are largely engaged in agriculture.

As a matter of fact, some of the most bloodthirsty savages —e.g., the Bornean head hunters—are known to display the tenderest feelings towards children.

Evolution has Ceased among the Civilised as regards the Intellectual Side of Mind.

While in civilised communities the division of labour has resulted in a rough sorting into mental grades, intellectual and moral, so that in the upper social grades the intellectual (and moral) level rises above that of the pre-civilised communities, intellectual evolution has ceased among the civilised, because in their case the factors which determined man's intellectual evolution from the ape standard no longer operate.

From the time the pre-human ape abandoned an arboreal for a terrestrial life—to go back no further—right down to the dawn of modern civilisation, superior intelligence played a large part in determining survival. In this connexion let me again insist that prior to this period the population of the world had for long ages remained practically stationary. This implied a severe elimination, and in general the elimination was one affecting the less, rather than the more, intelligent.

We have seen how such was necessarily the case all the time man was developing sufficient intelligence to become a skilled hunter; how, again, inter-tribal warfare, which was the great agency in keeping the population within its rigid limit, similarly led to the survival of the most intelligent; and how, also, polygamy, diminishing as it did the reproductive output of the least intelligent, had the same effect. Observe that each of these factors led not only to an elimination of the subnormal in intellect, but also of those possessed of *average intellect, these having to make way for supernormal types.* Intellectual evolution necessarily resulted.

In civilised communities, on the other hand, the conditions are such that men of super-normal intellect stand no greater chance of survival than those of normal (average) intellect. Only those falling distinctly below the normal intellectual standard tend to be eliminated. Men of indifferent intelligence have much the same chance of leaving offspring as others. And not only have all the factors which make for intellectual evolution ceased to operate among the civilised, but in some communities a factor has come into operation which is actually tending to lower the intellectual standard—I mean the curtailment of the birth-rate among the higher social grades, in consequence of which the intellectually inferior are multiplying more rapidly than the intellectually superior. The effect of this must be to lower the intellectual standard. It does not seem improbable, however, that this disproportion in the birth-rate is only temporary, and that before long the birth-rate of the lower classes will approximate to that of the upper classes.

Among Civilised Peoples Evolution is Continuing as Regards the Feelings.

I have shown that natural selection is still actively at work on the feeling side of mind: the lazy, the intemperate, the dishonest, the aggressively anti-social, those who love not home life, those who shun the cares and self-sacrifice demanded of fatherhood and motherhood, these are one and all being eliminated, while their opposites are surviving, and the attributes which secure their survival are becoming racially accentuated. In other words, man is still evolving and will continue to evolve on the moral side.

On the other hand, the comparatively low birth-rate among the upper social classes, who in the realm of feeling (as of intellect) are the superiors of the lower classes, is, for the time at least, tending somewhat to lower the standard as regards the affective side of mind.

A question of interest, which, however, I am unable to discuss on the present occasion, is whether the evolution which I assume to be still proceeding on the moral side does not imply some degree of intellectual evolution.

I have endeavoured in this paper to indicate the main factors which have determined man's evolution from the ape. If I have correctly done this, we must conclude that that evolution has taken place essentially through bloodshed. This fact stands out glaringly. It has been indirectly through the slaughter of inferior animals, and directly through the slaughter of his own kind, that man, "the roof and crown of things," has risen to his present eminence. In his upward march he has left behind him one long trail of blood.

THE REPORT OF THE ANTITYPHOID COMMITTEE.

PERSONNEL OF COMMITTEE AND SCOPE OF INQUIRY.

THE Antityphoid Committee was appointed in 1904 by the Army Council, having as its object "to investigate the practical prophylactic and therapeutic value of current methods of immunisation against enteric fever." The *personnel* of the committee at the time of its appointment was as follows:—Colonel (now Sir) David Bruce, F.R.S., Professor William Bulloch, Dr. F. Foord Caiger, Dr. James Galloway, Major (now Sir) W. B. Leishman, Dr. Robert Bruce Low, Professor A. Macfadyen, Dr. C. J. Martin, F.R.S., director of the Lister Institute of Preventive Medicine (chairman); and Professor (now Sir) Almroth Wright, F.R.S., lecturer on bacteriology, St. Mary's Hospital.

Professor Bulloch and Sir Almroth Wright having resigned, and Dr. Allan Macfadyen having died, Sir J. Rose Bradford, F.R.S., was appointed to the committee on March 8th, 1907, and Dr. George Dean. Dr. C. J. Martin has been chairman throughout. The duty of secretary has been performed by Lieutenant-Colonel Bruce Skinner, R.A.M.C., for the major part of the period covered by the work of the committee, and after his departure from the War Office for India, Lieutenant-Colonel Melville, R.A.M.C., and Mr. E. T. Gann have in succession filled the post.

It was agreed that the experimental work, which it was seen would be necessary, should be entrusted to Sir William Leishman, professor of pathology at the Army Medical College, and to such other officers of the Royal Army Medical Corps as he required to collaborate with him. The following officers have collaborated since the commencement of the work in 1905 for varying periods—namely, Major W. S. Harrison, Major H. W. Grattan, Major S. L. Cummins, Captain A. L. A. Webb, Captain A. B. Smallman, Captain C. C. Cumming, Lieutenant F. M. G. Tulloch, and Lieutenant R. G. Archibald, in addition to the officers engaged upon the statistical summaries. The greater part of the experimental work has been published from time to time in the *Journal of the Royal Army Medical Corps* and the *Journal of the Royal Institute of Public Health*, and has received notice in the columns of THE LANCET, and in the report the definite conclusions alone are collated, freed from technical detail, while the publication of the report has been delayed to await the due accumulation of statistical evidence, which could only be obtained from regiments sent on foreign service.

Short History of Typhoid Inoculation.

The report summarises briefly the history of the attempt to apply to man the processes of artificial immunisation against typhoid fever, stating that the first attempts were made individually by Sir Almroth Wright,[1] Pfeiffer and Kolle by inoculating dead cultures of typhoid bacilli into man with no bad effects, all the workers acknowledging indebtedness to Haffkine, whose experiments upon cholera vaccination in man had served as the pattern. In the years following these first attempts progress made in connexion with the subject is rightly attributed to Wright, and it was not until the publication of the statistical results of his work that the method was adopted on any scale in other countries.

The committee have already recommended to the Army Council in an interim report[2] that the system of inoculation, which had temporarily been in abeyance, should be re-introduced into the Army as a voluntary measure; but, in addition to this, they recommended that investigations should be commenced with a view to the introduction of possible improvements in the system introduced by Sir A. E. Wright. Acting on the recommendation of the committee, sanction was given by the Army Council for the recommencement of the inoculations and also for the carrying out of the experimental work of the committee described. The first portion of this experimental work was the systematic investigation of the blood changes which follow the inoculation of typhoid vaccine, and as soon as the re-adoption of the system had been sanctioned this was proceeded with, the experiments being carried out by Lieutenant-Colonel

[1] See THE LANCET, Sept. 19th, 1896.
[2] THE LANCET, May 19th, 1906, p. 1402.

Leishman and his colleagues, Major Harris, Captain Smallman and Lieutenant Tulloch.

INVESTIGATION OF THE BLOOD CHANGES WHICH FOLLOW TYPHOID INOCULATION.

The report proceeds to set out the details and findings of the investigation of blood changes which follow typhoid inoculation. The general purpose of the experiments is defined, the vaccines employed and their dosage are given, and the results of the tests are illustrated by charts. As regards the general results of the investigation the following conclusions have been drawn by the committee :—

1. The quantity of vaccine given, even in the case of Group "A" which received the highest amount, had not resulted in local or general reactions of any undue severity and the effects of inoculation had passed off, in almost all cases, within 48 hours. The severity of the reactions was noted to correspond to a certain extent with the amount of vaccine used. The relative severity of the first and second doses was inconsistent; it appeared, however, that in those who had the largest initial dose, the second inoculation, of double this quantity, produced a smaller degree of discomfort than the first. On the other hand, those who had received but a small quantity of vaccine as a first inoculation suffered rather more at their second inoculation, when receiving twice what was given at the first dose.

2. The effects of the inoculations upon the blood was the development of a remarkable rise in the agglutinins, bacteriolysins, and bactericidal substances. These rose to heights far above the normal range, and, even in the case of the group which received the smallest doses, remained well above the normal at the termination of the month during which the observations lasted.

3. As regards the relationship between the dose of the vaccine and the subsequent development of the above substances, while the advantage appeared to lie with the Group "A," which received the largest dose, the values in this instance were but little above those recorded in Group "B," which received but half the quantity of vaccine given to "A." In Group "C," which received one-sixth of that given to "A," the values recorded were distinctly lower, but still by no means in proportion to the difference in dosage.

Taking into consideration the reactions as well as the development of these protective substances, the most suitable dose would appear to have been that given to Group "B," namely 566 million for the first inoculation and 1133 million for the second. (It may be added here that, although the vaccine itself has been modified from time to time, in the light of the experiments detailed further on, the above-mentioned first and second doses of dead bacteria have been approximately adhered to and are still in use.)

4. The various tests showed no evidence of the occurrence of a negative phase of resistance as an immediate result of inoculations, with the doubtful exception of the transient fall in the bactericidal power eight or nine days after reinoculation. As the first tests for the various substances were instituted within 16 hours after the initial dose had been given it would appear that, if such a phase had resulted, it must have been of a very ephemeral nature. The system of pooling the blood of several individuals of the same group admits the possibility of such a phase having occurred in individual cases, but, had this been common or even well marked in a single instance, it would hardly have failed to manifest itself in the daily analyses. In deciding upon the adoption for general use of the dose given to Group "B," in preference to that given to Group "A," this question of the possible danger of a negative phase was borne in mind, as there can be little doubt that the larger the dose of the vaccine the greater the likelihood of such a temporary diminution of resistance to infection.

5. The interval of 10 days between the administration of the two doses, adopted in this experiment, appeared to be satisfactory; at that time the protective substances had already made their appearance, and the immediate effects of reinoculation were not accompanied by any fall in the amount of these substances; on the contrary, it would seem to have stimulated their further elaboration.

6. The employment of a very small dose of vaccine in the case of the group of men "D," who had been inoculated five years before, did not confirm the anticipation that they would exhibit an exceptional response to such a dose in elaborating large quantities of protective substances.

In order to trace the subsequent fluctuations of the protective substances Captain Smallman accompanied the regiment (2nd Battalion Royal Fusiliers) to India, and was attached to it for three years, but the results of inoculation were indefinite or unsatisfactory, it being possible that the vaccine employed had been sterilised at a temperature unfavourable to its immunising properties.

Experiments on Alternative Methods of Killing the Bacteria.

The report details the work of the investigators in this direction, the principle adopted being to try a large number of methods of killing bacteria and make a collection of those which gave the most promising results for further tests, such as their suitability for accurate standardisation and their immunising properties when used for experimental animals. The report states :—

> The general aim of the above series of experiments was to ascertain whether any alternative method of sterilisation was preferable to that which had hitherto been employed. Several of the methods described appeared to be effective substitutes for heat, but none showed any decided signs of superiority; while, viewed from the standpoint of the criteria mentioned at the beginning of this chapter, few could be regarded as satisfactory. With regard to the second of these criteria—that the sterilised bacteria should show some autolysis when kept at blood heat—it appears reasonable to suppose, if the method of sterilisation had reacted upon the bacteria in such a way as to render them resistant to autolytic action, as in the case of alcohol, and also when the bacteria were exposed to temperatures ranging above 60° C., that such bacteria would not be as useful for vaccination purposes as those which could be readily broken up and digested by the action of the fluids and cells of the vaccinated man or animal. This view finds some support in connexion with the proved efficacy in the case of animals of a vaccine killed at a temperature of 53° C., and the proved inertness of vaccines killed at temperatures ranging from 62° C. to 65° C.

THE RELATIVE EFFICACY OF DIFFERENT VACCINES AND THE TECHNIQUE OF PREPARATION.

The committee proposed in this section of their work to prepare alternative vaccines and to test their efficiency on animals. The general character of the experiment is indicated with accompanying charts, with references to the *Journal of the Royal Army Medical Corps*, where the experiments in detail appeared. Among the experiments under this heading the most important were those made to ascertain the influence of the age of the vaccine upon its immunising properties. The general conclusion arrived at here was that a vaccine which is six months old may have lost by that time at least a part of its immunising efficacy. The report says :—

> While this deterioration must, therefore, be looked upon as a possibility, in the case of vaccines of this age or older at the time of their use, it is quite possible that it is not the case in all instances, and, indeed, there is some evidence from the statistical point to show that vaccines older than this may afford a certain degree of protection against actual infection. However this may be, on the conclusion of these experiments Sir William Leishman and his colleagues at once took steps to ensure that no vaccine of greater age than three months should be employed for inoculation, and instructions to this effect were printed upon the labels of each phial of vaccine and circulated to all concerned in its distribution. On reporting his action to the committee at their next meeting this step was fully approved.
>
> This question of the age of the vaccine may present a further explanation of the comparative failure of the system in certain instances. Before the results of the experiments just quoted were arrived at, it was not realised how rapid and extensive might be the deterioration of the vaccine through age. Although that issued in the past three or four years for use on troops at home has, in the great majority of instances, been no older than would appear from the above to be the safe limit, it is certain that at times, and especially in India, vaccines have been used older, sometimes very much older, than three months. In the light of the above experiments, it may be assumed that the degree of protection given by such old vaccines was very slight.

The committee also came to the conclusion as a result of experiment that it was desirable to keep vaccine at a moderate temperature, and that extremes of heat or cold were to a certain extent deleterious.

Experiments Bearing on the Technique of Preparation of the Vaccine.

These experiments are described, and an important chapter is also furnished on the best means by which the strength of the vaccine at present employed for the immunisation of troops can be ascertained and uniformity of dosage secured. As a result of examination of the various methods suggested for the standardisation of vaccines the enumeration of a number of bacteria in a given quantity of vaccine was adopted as the most accurate and convenient.

Many direct experiments with vaccines were made to attempt to reduce the severity of the reaction. Search for a special vaccine giving little or no reaction, while showing no diminution of immunising powers, was unsuccessful. The use of an inert fluid in place of a nutrient broth was of little or no effect. Besredka's vaccine, in which a certain amount of an antityphoid serum is present, appeared to have no advantages, but there was evidence that vaccines quite freshly prepared—that is, less than three weeks old—give rise to local and constitutional symptoms which are more marked than customary. It appears from the report that in a large proportion of cases, roughly about 25 per cent. of the whole, systemic reaction is practically non-existent, and in the other cases a considerable personal variation is evident. Experience has further shown the necessity of inoculating the subjects some four or six hours before bedtime, so that they will be rested at the time of reaction, while avoidance of muscular fatigue, of exposure to sun, and of alcohol are mentioned as being of value.

It is gratifying, says the report, to record that of the many thousands of inoculations which have been carried out with typhoid vaccine, only one case of suppuration has been reported at the site of inoculation; in this instance the inoculating officer acknowledged that he had not taken the precautions detailed in the instructions issued with every dose. It may therefore be said that, in this respect, the noculation of typhoid vaccine beneath the skin is as innocuous as the administration of any hypodermic remedy such as morphia; it is entirely a question of efficient sterilisation of the skin and of the syringe, the fluid itself

is perfectly sterile, which is more than can be claimed for the majority of hypodermic solutions administered in therapeutics.

The ingestion of pills or capsules of dead typhoid bacteria is condemned, at all events for the present.

THE STATISTICAL RESULTS OF INOCULATION.

The second part of the report deals with the statistical results of inoculation.

From the end of 1894 to the beginning of 1909 a medical officer was attached to each regiment or brigade leaving Great Britain for foreign service in order to collect accurate statistical information as to the results of inoculation. The medical officers detailed for this attachment were officers of two to three years' service, selected by Sir William Leishman, who had received special laboratory training, the following being an outline of their instructions:—

1. They are to be attached to the unit for a period of three years and are to accompany it on all its changes of station during this period.
2. They are to carry out the inoculations in their unit, both before embarkation and after their arrival at their station abroad.
3. They are to keep accurate records of all men inoculated, with full particulars of the vaccine used, date, dose, &c., and full detailed information of all cases of enteric fever, whether occurring among the inoculated or the non-inoculated.
4. They are to keep in touch with all men detached from the headquarters of the unit, in order to make sure that no case of real or suspected enteric escapes observation and record.
5. If not placed by the senior medical officer of the station in actual charge of the fever cases, they are to arrange that they obtain full particulars of such cases, and that they have access to them for the purpose of carrying out the blood tests in the manner in which they have been instructed.
6. They are to verify the diagnosis of enteric fever by bacteriological methods wherever possible.
7. They are to perform, or at least to attend, all post-mortem examinations on men dying of enteric fever, to record the post-mortem appearances in such cases, and to make cultures in the way they have been shown.
8. They are to arrange for the effective carrying out of their duties if sick or on leave.
9. For the information of the antityphoid committee they are to keep Lieutenant-Colonel Leishman posted in all that bears upon their special duties and to send him from time to time such returns as may be called for by him, showing the influence of inoculation upon the incidence, severity, mortality, &c., of enteric fever in their units.

The reports which followed upon the carrying out of these instructions were made by Captain A. B. Smallman, Captain E. J. Luxmoore, Captain E. G. R. Lithgow, Captain C. E. Fawcett, Lieutenant J. H. Graham and (later) Major W. D. Erskine, Captain H. G. Sherren, Captain E. G. Anthonisz, Captain A. O'Carroll, Captain C. M. Drew, Captain A. S. Littlejohns, Lieutenant J. B. G. Mulligan, Lieutenant F. D. G. Howell, Lieutenant W. H. Forsyth, Captain S. O'Grady, Lieutenant R. W. D. Leslie, Lieutenant E. Gibbon, Lieutenant J. du P. Langrishe, Lieutenant B. Johnson, Lieutenant H. G. Gibson, Lieutenant J. L. Wood, Lieutenant W. Mitchell, Lieutenant W. K. Beaman, Lieutenant G. H. Stevenson, and Lieutenant A. C. Amy, all of the Royal Army Medical Corps. The results of the reports have been analysed by Sir William Leishman and are appended as a short history of the events concerned with inoculation in each of the 24 units, while a table summarising the results of the whole of the units is also added. The gist of this table and of Sir William Leishman's summarising conclusions from the figures will be gathered from the final summary of the committee (see below). Sir William Leishman records his opinion that the reports, which are remarkably complete considering the numerous difficulties under which they were made, reflect the highest credit upon the officers who made them.

Cases of Typhoid Fever Among the Inoculated.

Fifty-six cases of typhoid fever occurred among the inoculated, and a subcommittee of the committee, consisting of Dr. Galloway, Dr. Caiger, and Sir William Leishman, have reported separately upon these, and upon 202 cases occurring among the non-inoculated. They find that the 258 cases were genuinely typhoid fever, and that the average severity of the inoculated cases was considerably less than that of the non-inoculated.

FINAL SUMMARY AND CONCLUSIONS.

The results of the more important of the various investigations undertaken for the committee, and the conclusions drawn from them, are briefly summarised by the committee as follows:—

A.—*Experimental Results.*

1. The development of immunity against the typhoid bacillus, as indicated by quantitative investigation of the various antibodies produced, was exhaustively studied both in man and animals.

2. The relative efficiency of vaccines prepared in different ways was then measured.

Vaccines made by a variety of methods were compared, but none found to possess material advantage over that of Sir A. E. Wright, provided the temperature employed for sterilisation be reduced to 53° C.

3. A large number of methods which had been suggested for the standardisation of vaccines were critically examined, and the enumeration of the number of bacteria in a given volume of vaccine was adopted as the most accurate and convenient.

4. The keeping qualities of the vaccine at various temperatures and under practical conditions, such as a voyage through the tropics, have been examined. Vaccines three months old were found to be efficient, but serious deterioration in immunising value was apparent in those which had been kept six months or upwards.

5. Careful experiments were made upon groups of volunteers, in order to determine the most effective system of dosage—viz., one affording adequate protection with the minimum of temporary disability to the soldier.

B.—*Statistical Results.*

The histories, as regards typhoid fever, of 19,31 soldiers, whose average period of service abroad was 20 months, were carefully followed, and every precaution possible was taken to verify the diagnosis bacteriologically. Of this number, 10,378 were inoculated, and 8936 not inoculated. The case incidence of typhoid fever among the inoculated was 5·39 per mille, and among the non-inoculated 30·4 per mille.

There is no reason for supposing that this difference can be attributed to a want of homogeneity between the two groups. The age distribution among inoculated and non-inoculated was approximately the same. They were intermingled and lived under identical conditions.

The experience of Lieutenant-Colonel Sir W. B. Leishman and the inoculating officers lends no support to the view that soldiers who, from their character and habits, might presumably be more likely to incur the risk of infection, present themselves for inoculation in smaller numbers than their more careful comrades.

In the opinion of the committee the substantial difference in the incidence can only be attributed to inoculation.

RECOMMENDATIONS.

The committee unanimously recommended that every measure which may be considered practicable should be employed to extend the practice of antityphoid inoculation in the army. In the opinion of the committee its universal application is desirable. They add that research work on preventive inoculation against typhoid fever, a subject of special importance to the army, should be continued.

Sir David Bruce's signature is absent from the report, he being abroad.

REPORT OF THE TROPICAL DISEASES RESEARCH FUND.[1]

THE Tropical Diseases Research Fund was instituted in 1904, and since then has done admirable work, though unfortunately hampered somewhat by insufficient pecuniary support. The report of the Advisory Committee for 1912 has lately been published, and shows a wide scope of investigation not only in the laboratory but also in the field. It is, however, extremely unsatisfactory to find that in the past year the expenditure has exceeded the income by £588, and that as a consequence the committee has been compelled to intimate to the Schools of Tropical Medicine, which have been receiving subsidies for the purpose of research, that in the present year the grants will have to be reduced. The amount contributed to the Research Fund by the British Government is the comparatively small sum of £1000, supplemented by £500 per annum from the Indian Government. Other yearly subscriptions are given by various colonies and dependencies, ranging from £350 contributed by Nigeria to £20 by St. Vincent, and bringing the total revenue for 1912 up to a sum of £3354. A grant of £750 was allotted to the University of London for the purpose of remunerating the professor of protozoology, and £350 were given to the University of Cambridge to defray the cost of a research scholarship in medical entomology, and to pay the salary of a consulting entomologist and of an assistant in the Quick Laboratory. The money paid to the London School of Tropical Medicine, £1533 6*s.* 8*d.*, was expended in supplementing the remuneration of the teachers and investigators of helminthology, protozoology, and arthropodology, and defraying some of the expenses of maintaining the various laboratories. Each of these teachers by the terms of his appointment is bound to carry out researches in some branch of his subject. The grant of £1200 to the Liverpool School of Tropical Medicine was expended partly in paying the salaries of the lecturers in economic entomology

[1] Tropical Diseases Research Fund: Report of the Advisory Committee for the Year 1912. Presented to both Houses of Parliament by command of His Majesty. London: His Majesty's Stationery Office. 1913. Pp. 198. Price 2*s.* 3*d.*

and parasitology, and partly in remunerating the workers on trypanosomiasis; a sum of £200 was paid also for the services of a scientific chemist. Appended to the report are a number of appendices containing scientific and other reports from the institutions subsidised by the fund, and from several of the colonies and dependencies.

Investigations into Mosquito-borne Diseases in the Crown Colonies and Dependencies.

A collective investigation is being carried out under the direction of the Advisory Committee into the question of mosquito-borne diseases, including malaria, blackwater fever, filariasis, yellow fever, and dengue, in certain of our colonies and dependencies. Some broad lines of inquiry have been indicated by the committee, and in response during the past year 14 reports on the subject have been received and are now reprinted in the committee's report for 1912. A considerable amount of detailed information is being accumulated with regard to the incidence of the above diseases and the circumstances associated with their occurrence in the various colonies, the means employed for treating the cases, and the measures devised to prevent their occurrence. The facts thus gathered together will in time prove of great value in advancing our knowledge of these maladies, their causes, treatment, and prevention. It was fitting that the committee should undertake such a collective investigation at the present time into mosquito-borne infections, as it becomes more obvious year by year that to this group of diseases is due a very large proportion of the sickness and mortality found in our tropical possessions.

Experimental Investigations by the Professor of Protozoology.

The professor of protozoology in the University of London gives an account of the work done in his department. Much of his time, it appears, has been devoted to the completion of a volume intended to serve as a guide to those students and investigators who, having some knowledge of biology, desire a closer acquaintance with the special problems presented by the protozoa. This useful work is to be entitled "An Introduction to the Study of the Protozoa, with Special Reference to the Parasitic Forms." In addition to the necessary work of teaching, Professor E. A. Minchin, in collaboration with Dr. J. D. Thomson, has carried out investigations upon the transmission of the rat trypanosome, T. lewisi, by the rat-flea and its development in that insect. These investigators believe that T. lewisi passes to the rat through the proboscis of the flea; and although they have not yet succeeded in demonstrating this completely, they are in hopes of being able to do so before long. Other research work was done in connexion with some of the subsidiary problems connected with transmission of trypanosomes. Another report reprinted by the committee is supplied by Dr. H. M. Woodcock, assistant to the University professor of protozoology, giving an account of his researches upon the blood parasites of birds.

Report on the Work done in the Quick Laboratory, Cambridge.

Professor G. H. F. Nuttall, F.R.S., in presenting his report, states that his own researches were made largely on pathogenic protozoa and on ticks. He mentions also that he paid a visit to America during the year and with the assistance of the Rockefeller Sanitary Commission for the Eradication of Hookworm Disease had the privilege of inspecting a number of places in North Carolina where ankylostomiasis is rampant among the white population. He proposes to furnish a special report on this subject at a later date.

Researches at the London School of Tropical Medicine.

The Advisory Committee print in an appendix reports received from the special departments of entomology, helminthology, and protozoology in the London School of Tropical Medicine, and prepared respectively by Colonel A. W. Alcock, I.M.S., F.R.S., Dr. R. T. Leiper, and Dr. C. M. Wenyon. As a sample of the work done at this school by these investigators we may quote the following done by Dr. Wenyon—an investigation into the pathogenicity of Entamœba tetragena; an inquiry into the behaviour of Leishmania tropica in bed bugs and fleas; observations on the natural flagellates of fleas; experiments with the virus of South American leishmaniasis; observations on the morphology of T. rhodesiense; and, lastly, experiments on the transmission of canine piroplasmosis by ticks collected at Aleppo in 1911. The investigations carried out in entomology and helminthology are of equal importance and practical value. The Board of Agriculture, it may be mentioned, gave the helminthological department of this school a grant of £100 during the year towards the cost of investigations upon pulmonary helminthiasis. In addition to other valuable work Dr. Leiper went to the Cameroons in 1912 to undertake important investigations in helminthology, more particularly as to the transmission of various blood-worms, including filaria loa.

Work Done in the Liverpool School of Tropical Medicine.

Among the various researches conducted in this school during the past year we may mention investigations made by Dr. J. W. W. Stephens and Dr. H. B. Fantham on T. rhodesiense and the results of the measurements of this parasite, and by the former of these experts on the fluke, Paropisthorchis caninus, of the Indian dog. At the Runcorn laboratories experiments were made on a number of subjects, and among others by Dr. B. Blacklock, to ascertain how long trypanosomes can retain their vitality in the dead body of the animal host; on the ecto-parasites of man and animals (at the request of Sir Ronald Ross), with the view of discovering a cheap and effective means of dealing with them; and on Piroplasma canis. Dr. R. Newstead, the professor of medical entomology, reports on the work done in his department. As a member of a commission appointed by the Colonial Office he visited Nyasaland to inquire into the bionomics of the tsetse fly Glossina morsitans, and to discover, if possible, its breeding grounds and to devise means for checking its spread. Also, he gives a descriptive account of all the known species of papataci flies in Africa, including two species new to science. Dr. G. C. Simpson reports on certain chemical studies he had made in connexion with beri-beri and diseases of nutrition, and the anti-neuritic substance contained in yeast and in other vegetable and animal foodstuffs. He also examined the blood from malarial cases for a hæmolytic principle, and made investigations on the hæmolysis of malaria, on quinine in malaria, the pyrexia of malaria, larvicides, and on pellagra.

Work Done in Colonial Laboratories.

British Guiana.—Dr. K. S. Wise and Dr. E. P. Minett, among other work, carried out investigations on filarial abscess, and they also give some notes on the vaccine treatment of leprosy.

Ceylon.—Dr. Aldo Castellani made a series of researches on certain new intestinal bacteria; on new species of endomyces; and on copra-itch. He also supplies some observations on the treatment of yaws.

Jamaica.—Dr. H. H. Scott furnishes a note on bacillus serofaciens, which he was the first to isolate and describe. He gives an account of the work done in his laboratory, including the examination of the blood of suspected enteric fever cases; also of rats for plague infection; ankylostomiasis, and the so-called vomiting sickness of Jamaica and cerebro-spinal fever.

The Federated Malay States.—Dr. H. Fraser, director of the Institute for Medical Research at Kuala Lumpur, contributes an account of some further researches on beri-beri, a subject with which his name, in conjunction with that of Dr. A. T. Stanton, is so honourably associated. The latter expert continues his inquiries into malaria and its propagation, and gives some account of the bacteriological work carried on at the institute. Experiments on leprosy, to cultivate the bacillus with blood media, are reported, and some details of inquiries made into epidemic conjunctivitis, blackwater fever, &c., are given.

St. Lucia (Windward Islands).—Dr. Lucius Nicholls submits an account of experimental work which he performed on the relation of the causal organism of leprosy to the stomachs of insects, the breeding places and diseases of anopheline larvæ, and ankylostomiasis in domestic animals.

The last report printed by the Advisory Committee is that presented to the Secretary of State by Captain T. J. Potter, R.A.M.C., on the Vomiting Sickness of Jamaica, to which we have already directed attention in THE LANCET of April 19th, p. 1111.

From the above brief outline of what is being done under the direction of the Advisory Committee through the help of the Tropical Diseases Research Fund, it is obvious that the work covers a very wide field and that it is of a very

valuable kind. But we repeat that it is to be deplored that a wealthy nation like Great Britain should not give more generous financial support to the scientific investigation of tropical diseases on modern lines. In our opinion, even if the amount at present given were increased tenfold, it could not then be regarded as by any means excessive in view of the material benefits which would be likely to result.

THE FINAL REPORT OF THE ROYAL COMMISSION ON UNIVERSITY EDUCATION IN LONDON.

V.[1]

THE next subject in the Report is the all-important one of the organisation of the Faculty of Medicine, the medical curriculum in its three main divisions having been considered, and the procedure with regard to clinical instruction having been made the subject of succinct conclusions. It will, however, be convenient here to interpolate in their own words the views of the Commissioners upon the question of a single portal to the medical profession in this country, and upon the well-established grievance of the London medical students that they are unable to get a university degree upon what are called reasonably accessible terms.

The Question of a Single Portal.

The question was brought before the Commissioners by the Presidents of the Royal College of Physicians of London and the Royal College of Surgeons of England, and Mr. F. G. Hallett, the secretary of the Conjoint Board. The Commissioners say :—

According to this scheme the single portal by which all would enter the medical profession is the final examination in medicine, surgery, and midwifery of the Conjoint Board of the Royal Colleges of Physicians and Surgeons.

If a student had passed the earlier examinations in a university, and completed a course of medical study extending to five years, he would be admitted to this final examination, and having passed it would be entitled, upon payment of the fees required by the Royal Colleges, to the diplomas of L.R.C.P., M.R.C.S. His university would require further study, and probably additional subjects, and might require additional examinations, in order to entitle him to the medical degree of the university.

A student who was not a member of any university, but had passed a preliminary examination recognised by the Conjoint Board, and the preliminary and intermediate science examinations of that Board, would obtain the diplomas of the Royal Colleges upon passing his final examination, but could not, of course, proceed to a university degree.

Under this scheme it is proposed that the universities should either appoint representatives on the committee of management of the Conjoint examinations, or appoint assessors to be present during the examination of their own students, or should simply agree to accept in lieu of their own examination in the final professional subjects of medicine, surgery, and midwifery, the examination of the Conjoint Board. The Conjoint Board, on the other hand, would continue to admit to this final examination not only students who had taken the earlier part of their course in a university, but also students who had passed the preliminary examination accepted by the Conjoint Board, which is of a lower standard than the matriculation of the universities, and had also taken the examinations held or accepted by the Conjoint Board in the preliminary and intermediate sciences. In view of the provisions of Section 3 of the Medical Act, 1886, such a scheme would probably require the authority of Parliament.

There is no inconvenience to a university in examining its own students in the final subjects of the medical degree, and the main reason given for ceasing to do so, and accepting the Conjoint Board examination instead, is that a large number of the medical students who reach the final examination for the degree of M.B. of the universities in England have already passed the final examination of the Conjoint Board, and it is said to be a hardship that they should be compelled to pass two examinations in the same subjects. About 67 per cent., we were told, of the university students who reach the final examination of the University also take the final of the Conjoint Board. Of the Oxford, Cambridge, and London University students, the percentage who also take the Conjoint final is 82, while of the degree students of the northern universities it is not more than 40.

The general question of the advisability of a single portal as the entrance to the medical profession is beyond our reference. Without ascertaining the views of all the universities and other licensing authorities whose consent and agreement would be required for the introduction of such a system, we are not in a position to form a considered opinion on the question. To ascertain these views would carry us far beyond the scope of our inquiry. But, having heard the evidence we have referred to, we think it is not beyond our reference to consider whether it might be desirable and feasible for the University of London alone to make an arrangement with the Royal Colleges with regard to the final examination.

The end we have in view is to raise professional education—in this case medical education—as far as possible to a university level; and if the University of London were to join in an arrangement between all the English universities and the Royal Colleges for the conduct of the final examination, it might be possible on the other hand for the Royal Colleges to require that all candidates for their diplomas should take the courses and examinations of the universities in the earlier part of their curriculum.

It seems to us that a uniform standard of professional attainment for entrance to the medical profession is less urgently required in England than a higher standard of entrance to the medical curriculum, and a more scientific foundation for the professional studies; and therefore we think the permanently open door of the Conjoint Board to a lower level of general education than the universities require, and an examination in the more purely scientific part of the medical curriculum which tends to hamper the teaching by the requirements of a prescribed syllabus, is a greater dis-service to medical education than any slight variation of standard in professional attainment which the final examinations of the universities may allow.

The reasons given for the establishment of a single portal do not appear to us very convincing when taken by themselves and apart from any such changes as we have just referred to. First, it is said the number of licensing authorities has been largely increased by the creation of new universities. This would have more weight if there was any real danger of the standard being lowered, but we do not think it is suggested that the General Medical Council fails to perform its inspecting duties efficiently, still less that the qualification granted by any university is at the minimum standard. Secondly, it is said that the Government and municipal medical services are increasing the demand for official, as compared with private, medical practitioners. But what is specially required for a public medical service is the scientific training of a university education, rather than strict uniformity of professional attainment. Thirdly, it is said that the endowment of the medical departments of the universities, and of independent medical schools, by the State through the Board of Education, entails a system of government inspection of these departments or schools, and that from inspection to control, dependent upon results of examinations, with a view to uniformity, is a short step. We are not sure that we understand this argument. The Board of Education grants to medical schools are university grants, and it is contrary to the declared policy of the Board to interfere with the educational freedom of the universities. If it were not so, we should be strongly opposed to such a method of subsidising university education.

It would not be possible under a separate arrangement between the University of London and the Royal Colleges to insist on the Royal Colleges reciprocating by requiring a university standard of general education, and university courses and examinations for the earlier parts of the curriculum, because if such an arrangement were made with regard to London students, and did not apply to other candidates for the diplomas, all the purely Conjoint men would be driven out of the London medical schools, a result which the Royal Colleges would not face and the University of London would not desire. Moreover, such an agreement might not be possible, as we were told that the northern universities had announced their intention of opposing any exclusive agreement between London University and the Royal Colleges.

We have given the question our most careful consideration, and we are not prepared to recommend that the University of London should give up examining in the final subjects of medicine, surgery, and midwifery. When great internal educational reforms are being proposed, it is hardly the time for the University to commit itself definitely to any system of examinations beyond its own control. We are satisfied by the evidence we have taken that the examinations of the Conjoint Board are admirably arranged and efficiently conducted. It is claimed as their chief merit that the examiners appointed are teachers, and teachers at their best; that they are chosen from all the London medical schools under conditions which ensure that they are men in the middle period of their career whose powers are at their highest. This is as it should be, but we cannot tell what the state of things would be if any far-reaching change of the organisation of clinical teaching, such as we have proposed, should be introduced; and in these circumstances we cannot recommend that the University should agree, perhaps irrevocably, to the examination of its students by examiners appointed by an external authority.

The Grievance of the London Medical Students.

The grievance of the London medical students that they are unable to obtain a university degree upon what are called reasonably accessible terms is of old standing. The grievance existed long before the University of London was reconstituted, and the history of the controversy about it, and of the various efforts to remove it, is fully given in the late Sir William Allchin's "Account of the Reconstruction of the University of London." The Report only considers the grievance as it stands now, and begins by admitting that it is often damaging to a man in the practice of the profession of medicine, and also to his social position, if it can be said of him that he has no right to assume the title of "doctor," because in ordinary language a doctor means a qualified medical practitioner, and the common inference is that in some way he holds an inferior if not an insufficient qualification, and, as it is expressed "is not a proper doctor." The Report says :—

It is said that this is not merely a misunderstanding, but that frequently it is the malicious innuendo of professional rivals. But, malice apart, if the grievance was only that a man's real qualification was not understood, this could probably be met by giving him the legal right to call himself "doctor." If this meets the case it is in the power of the profession to authorise it, and as it has nothing to do with university education it does not concern us. The Royal College of Physicians of London until recently refused to allow the holders of their diplomas to assume the title of "doctor"; but we understand the College has now passed a by-law in the opposite sense. Another complaint is that certain appointments are limited to those who have a degree in medicine, and that the Licentiates of the Royal Colleges are consequently excluded. But this is a legitimate grievance only if the

[1] Nos. I., II., III., and IV. were published in THE LANCET of April 26th (p. 1184), and May 3rd (p. 1251), 10th (p. 1336), and 17th (p. 1410), 1913, respectively.

exclusion is unjustified by any difference of qualification, and, of course, that is what is really alleged. It is said that the Conjoint Board men have gone through as severe a curriculum, and passed a series of examinations of as high a standard as men who have graduated at one of the provincial universities, and that they ought to be able to get a medical degree in London upon the same terms. We are not in a position to say how far this statement is true. The tables put in by Dr. Collingwood are not conclusive on the point. They show, indeed, that in professional examinations for admission to the Army, Navy, and Indian Medical Services the Conjoint Board men do exceedingly well. But we do not know what men go in for these examinations; and in any case, if the results were accepted as a fair basis for comparing the education of the Conjoint Board men with that of the University men, they would prove too much, because the Conjoint Board men appear to do better than the London University men, and the question would arise why, if they are so well prepared, they do not take the London University degree. The conclusion we arrive at is that we cannot deal with the alleged grievance of the London medical students by considering the conditions upon which a university degree is obtainable elsewhere, and endeavouring to provide an exact equivalent in London University. We are convinced that the proper course for us to take is to consider what in this Faculty, as in others, is essential to a real university education, and to endeavour to make recommendations which will result in adequate provision being made in London for this education being opened to all who are able to profit by it. The degree will follow in the ordinary course, and the grievance should naturally disappear. So far as entrance to the University is concerned, the average London student has undoubtedly been under a real disadvantage in the past, partly because the present matriculation examination is not connected with a well-developed system of secondary education, and many of the schools from which medical students come have not prepared their pupils for that examination, while the University has in the past been loath to accept equivalent qualifications, and partly because the Conjoint Board and the General Medical Council accept lower standards of admission to the minimum medical curriculum, and the students do not realise till it is too late that they are excluded from the beginning of their course from taking a university degree. The fact is very significant in this connexion that the students of the London School of Medicine for Women, who, until quite recently, were not admitted to the examinations of the Conjoint Board, have not found any difficulty in taking the degree of London University, and have been able to do so on the average in a shorter time than the men.

The Commissioners conclude that it is most regrettable that so large a proportion of the medical students in London do not graduate through its University. They find that the whole difficulty resolves itself into one of defective education, and that the true solution of it is the institution of such a system of school examinations as they have recommended for entrance to the University. Every student qualified by his previous education for university studies would thus be admitted as an undergraduate without any need for special preparation or for a special acquaintance with the University regulations, and when a student was once in his course would be systematic and educative. He would not be required to pass tests for which he had not had full opportunity of preparing, and he would fail only if he was unfit or had neglected the opportunities afforded him. And if either of these was the case he ought not to succeed.

(To be continued.)

Public Health.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

Metropolitan Borough of Chelsea.—Dr. Louis C. Parkes gives some interesting particulars of the artisans' dwellings which are to be erected by the Sam Lewis trustees on a site acquired during the year in the neighbourhood of Pond-place, Chelsea. There will be nine parallel blocks, five storeys high, without basements and separated by courtyards 40 feet in width. The tenements will be of the "self-contained" type, with open balcony, water-closet, drying space, and a combined scullery and bathroom. The kitchen range will be in the scullery, and there will be a combination fireplace for the kitchen and living room with a sliding fireclay shutter. Gas-cookers will also be fixed. Provision will be made for 5 four-room, 155 three-room, 190 two-room, and 40 single-room tenements. There will thus be 925 rooms in the dwellings, which at 1½ persons per room gives a population of 1387. The living rooms will have a superficial area of 180 square feet, with bow windows, the bedrooms of the three-room tenements will have a superficial area of 110 and 100 square feet, and the bedrooms of the two-room tenements will have 130 feet. All rooms will be 8½ feet high. These Lewis Trust buildings, when provided, together with the Sutton Trust buildings, which are now approaching completion, will give accommodation in artisans' dwellings for a population of 3590, to which must be added a population of 3390 now accommodated by the borough council's four sets of dwellings, and in the Marlborough, Guinness, Peabody, and Chelsea Park buildings. As Dr. Parkes observes, there are probably few places in the United Kingdon where so many people of the wage-earning class, in proportion to population (that of Chelsea is about 66,000), will be able to find so much accommodation in artisans' dwellings as in the Chelsea that will be in two years time. It is no disparagement at all to this work to note from another part of the report that there are families in Chelsea who probably could not afford even the lowest rents obtainable in these dwellings. Many families which were visited on account of reports of verminous conditions of the children attending school were found to be living under conditions of extreme poverty. In these cases, as Dr. Parkes points out, it is doubtful if the children ever have their day clothing entirely removed or "go to bed" at all in the ordinary meaning of the words. In such families the mattresses and palliasses are so dilapidated and filthy that sometimes the only possible course is to destroy them and provide new bedding. Where blankets or sheets existed it was "doubtful from their appearance if they ever make the acquaintance of the wash-tub from one year's end to another." Some of the worst cases of neglect or apathy on the part of the parents have been prosecuted by the London County Council, but it does not appear to be much use to inflict small fines on people who are living a hand-to-mouth life on the verge of destitution. So far as benefit to the children is concerned, Dr. Parkes considers that the only practicable course is to remove them from such homes as these and educate them in the Poor-law schools at the cost of the rates. The report speaks highly of the work of the Chelsea Health Society and other voluntary organisations whose coöperation with the public health department has done much to prevent disease and suffering, especially in regard to the child population.

Borough of Ramsgate.—The population of this well-known seaside resort is now close on 30,000, a figure which is almost trebled in the summer months. Its water-supply is obtained from some two miles of adits, driven into the chalk a little over a mile from the sea, which intercept the water flowing in the numerous fissures which are found in this formation. The supply is pure and free from organic contamination, but is naturally hard. From a series of monthly analyses quoted by Dr. J. Dundas, however, it appears that year by year since 1909 the total and permanent hardness and also the proportion of chlorides in the water have steadily decreased, the fall in the total hardness being from about 30 in 1909 to 25 in 1912, while the chlorides, which were in amounts such as 22 grains per gallon, have now been reduced to about 11 grains. The reason no doubt is that in the past the pumps have drawn on a reserve of water which had long been stagnant in the chalk, while that which is now obtained has traversed the chalk much more quickly. Similarly the common salt in the chalk of the water-bearing area is being gradually washed out and probably will still further decline. These changes, so far as the chemical constitution of the water is concerned, are all to the advantage of the town. The present report chronicles several improvements in details of sanitary administration. By-laws have now been adopted for houses let in lodgings as a result of a special house-to-house inspection by the medical officer of health and sanitary inspector in the Blue Mountain district and have already proved of great utility in the case of poorer-class lodgings which were overcrowded or otherwise insanitary. More than half the houses in the district have been inspected for the purposes of the Housing and Town Planning Act and repairs and improvements insisted upon. Something has been done also to deal with general shops and stores which retailed milk under unwholesome conditions, and at about a quarter of these shops milk selling has now been abandoned. A considerable amount of adulterated or low-quality milk seems to be sold in Ramsgate. Six samples out of 42 contained less than the low official "standard" of 3 per cent. of fat, although the average figure for fat in all the samples was as high as 3·54 per cent. Dr. Dundas urges the public to insist on seeing from time to time the reports of analysts on samples which have been submitted by the milkmen themselves, but we doubt if unfavourable analyses would be shown, or whether samples of poor quality would, in fact, be sent for analysis. The consumption of shell-fish from contaminated sources was suspected as the

cause of 10 out of 13 cases of enteric fever notified in Ramsgate during 1912, and it seems probable that this figure would have to be increased if it were possible to add the cases in which visitors to the town had been infected by shell-fish and developed the disease elsewhere. Stress is laid in particular on the sewage pollution of cockles obtained from Pegwell Bay and of shell-fish gathered on the foreshore or mudbanks in Ramsgate harbour. In the absence apparently of more definite powers of control the chief precautions have consisted in the posting of warning notices in likely places, and the inspection of the homes of the shell-fish vendors, who are urged to boil all shell-fish intended for human consumption for at least five minutes.

Borough and Port of Lancaster.—Dr. H. J. Cates, in making his first report in the capacity of medical officer of health of this city, illustrates it with a useful series of diagrams of the incidence of different diseases, which we hope to see continued in future reports; and he records a reorganisation of the public health department which has enabled activity to be shown in various useful directions. The report draws special attention to the need for securing cleanliness in the preparation of food and on the fallacy of relying upon ordinary cooking to remove the dangers of contaminated food materials. Cooking is often insufficient to destroy the micro-organisms; if they are killed their poisons may remain; and food may, of course, be infected after it has been cooked. "Precautions are being taken, and quite rightly, to prevent the spread of consumption, but nothing has been done to meet the case of the consumptive who takes part in the preparation or sale of food." This is true, no doubt, so far as legislation is concerned and while the Local Government Board's Regulations prevent the notification of tuberculosis from being used so as to hamper the tuberculous patient in obtaining his livelihood. But, on the other hand, the work which is being done in this direction by advisory methods, through home visiting and dispensaries, is already considerable, and is, from some points of view, to be preferred to the exercise of authority. Dr. Cates's suggestion that the Lancaster town council should establish a municipal ice-cream factory, something on the lines of a public washhouse, where for a small charge makers could prepare and store their stocks of ice-cream, seems at first sight rather fanciful, but on consideration of the kind of people in the itinerant ice-cream trade and of the conditions of their houses we think that a good deal could be said for the proposal, and we should be glad to see it tried.

REPORTS ON CHILD HYGIENE.

Newport Town Council.—The town of Newport is fortunate in having a representative and responsible committee which makes the care of infant lives its special aim. The committee consists partly of private individuals and partly of all the members of the local health committee, and its fourth annual report, which we have before us, is issued with an introduction by the honorary medical officer, Dr. J. Howard-Jones. During 1912 3989½ gallons of milk were supplied to 136 necessitous mothers. Three "schools for mothers" exist, and the scope of their work is increasing. Nearly every baby attending the centres is breast-fed. The existence of the committee is a powerful stimulus to the activity of the local authority in connexion with infant hygiene, and during the year no less than 3563 visits were made by the corporation health visitors. The result is partly reflected in the infantile death-rate, which in 1910 was 119, in 1911 134, but in 1912 only 108·7 per 1000. The death-rate among children whose mothers were supplied with milk was 186 in 1910, 94 in 1911, and 47 (unrevised figure) in 1912.

Birmingham Corporation.—The report of the Special Schools After-Care Subcommittee is of particular interest at the present moment in view of the efforts which are being made to secure a greater degree of control over mental defectives after school age. The committee was formed in 1901 with the object of keeping a record of the after school history of such children. From these records it can be clearly seen how these cases drift either to workhouses, inebriate homes, or prisons. Of 932 cases analysed 272 were doing remunerative work at a wage varying from 3*d.* to 20*s.* per week (average 7*s.* 1*d.*), 7 work with parents at home, 57 are living at home doing no paid work, 32 were dismissed from special schools as mentally or physically incapable, 101 were transferred to ordinary schools, 39 were at a residential school, 49 in the workhouse, 85 in other institutions, 33 were dead, 240 lost to sight, and 2 in special schools in other towns. Of those employed the majority work irregularly, the periods of "idleness" being seven years in one case and two years in two others. Of the 272 in employment the majority (243) are between 14 and 21 years. Summing up the record of cases the report states: "The records of this committee prove the necessity for compulsory registration and supervision of all cases of mental defect."

Deptford School Clinic.—The third report covers the period from August, 1911, to July, 1912, and records the treatment of 6500 children. The cases treated include defects of vision and of ear, nose, and throat, as well as skin troubles, anæmia and spinal deformities. Remedial exercises for spinal curvature and post-operative treatments of nose and throat cases are carried out by a special instructor. An interesting feature in connexion with the clinic is the institution of an open-air school with a night camp, at which nearly 50 boys attended with great improvement to their health. As an anæsthetic for the nose and throat operations ethyl chloride has been used throughout with complete success. The report goes into considerable detail of cases treated, and will be useful to all concerned in school medical inspection or treatment, as well as being an example of the excellent pioneer work which can be done by public-spirited individuals.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN the 96 English and Welsh towns with populations exceeding 50,000 persons at the last Census, and whose aggregate population at the middle of this year is estimated at 17,852,766 persons, 9018 births and 4765 deaths were registered during the week ended Saturday, May 10th. The annual rate of mortality in these towns, which had been 15·8, 14·8, and 14·2 per 1000 in the three preceding weeks, further declined to 13·9 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 14·9, against a corresponding rate of 15·0 per 1000 in London during the same period. The death-rates during the week ranged from 7·5 in Acton, 8·1 in Bournemouth, 8·3 in Edmonton, 8·6 in Eastbourne, and 8·8 in Southend-on-Sea, to 18·8 in Carlisle and in Aberdare, 19·9 in Stockton-on-Tees, 20·2 in Bootle, 20·3 in Middlesbrough, and 22·3 in Walsall.

The 4765 deaths from all causes were 101 fewer than the number in the previous week, and included 381 which were referred to the principal epidemic diseases, against 338 and 388 in the two preceding weeks. Of these 381 deaths, 151 resulted from measles, 83 from whooping-cough, 79 from infantile diarrhœal diseases, 40 from diphtheria, 16 from scarlet fever, and 12 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases during the week under notice was equal to 1·1, against 1·0 and 1·1 per 1000 in the two preceding weeks. The deaths attributed to measles, which had been 203, 141, and 149 in the three preceding weeks, were 151 in the week under review, and caused the highest annual death-rates of 1·6 in Wolverhampton, 2·3 in Edmonton, 2·7 in Wimbledon, 3·5 in Smethwick, 4·5 in Walsall, and 5·8 in St. Helens. The deaths referred to whooping-cough, which had steadily risen from 50 to 94 in the four preceding weeks, declined to 83, and included 21 in London, 6 in Stoke-on-Trent, 5 in Leeds, and 4 each in Brighton, in Birmingham, in Liverpool, in Manchester, in Hull, and in Newcastle-on-Tyne. The fatal cases of diarrhœa and enteritis (among infants under 2 years of age), which had been 65, 56, and 75 in the three preceding weeks, further rose to 79; of this number 27 were recorded in London, 7 in Liverpool, 5 in Sheffield, 3 in Burnley, and 3 in Leeds. The deaths attributed to diphtheria, which had been 41, 37, and 39 in the three preceding weeks, numbered 40, and included 3 in London, 3 in Portsmouth, and 2 each in Stoke-on-Trent, Birmingham, Coventry, Bolton, Bradford, and South Shields. The deaths referred to scarlet fever, which had been 17, 14, and 22 in the three preceding weeks, declined to 16, of which number 3 were registered in London, 2 in Liverpool, and

2 in Manchester. The 12 fatal cases of enteric fever were equal to the average in the earlier weeks of the quarter, and included 3 in London and 2 in Manchester.

The number of scarlet fever patients under treatment in the Metropolitan Asylums and the London Fever Hospitals, which had been 1334, 1339, and 1375 at the end of the three preceding weeks, had further risen to 1403 on Saturday, May 10th; 206 new cases were admitted during the week, against 215, 185, and 216 in the three preceding weeks. These hospitals also contained on the date mentioned 788 cases of diphtheria, 629 of measles, 289 of whooping-cough, 34 of enteric fever, and 1 of small-pox. The 1175 deaths from all causes in London were 55 fewer than the number in the previous week, and were equal to an annual death-rate of 13·6 per 1000. The deaths referred to diseases of the respiratory system, which had been 329, 245, and 255 in the three preceding weeks, fell to 210, and were 34 below the number recorded in the corresponding week of last year.

Of the 4765 deaths from all causes in the 96 towns, 199 resulted from various forms of violence, and 405 were the subject of coroners' inquests. The causes of 38, or 0·8 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Sheffield, Bristol, West Ham, Bradford, Hull, Newcastle-on-Tyne, Nottingham, and in 66 other smaller towns. Of the 38 uncertified causes of death, 6 were registered in Birmingham, 6 in Liverpool, and 2 each in Warrington, Manchester, Preston, Barrow-in-Furness, and South Shields.

In the 96 English and Welsh towns 7833 births and 4368 deaths were registered during the week ended Saturday, May 17th. The annual rate of mortality in these towns, which had steadily declined from 15·8 to 13·9 per 1000 in the four preceding weeks, further fell to 12·8 per 1000 in the week under notice. During the first seven weeks of the current quarter the mean annual death-rate in these towns averaged 14·6 per 1000 and coincided with the corresponding rate recorded in London during the same period. The annual death-rates last week ranged from 5·8 in Oxford, 6·4 in Great Yarmouth, 6·6 in Ilford, 7·0 in Reading and in Lincoln, and 7·7 in Tynemouth and in Newport (Mon.), to 19·2 in Brighton, 20·3 in Stoke-on-Trent, 20·8 in Preston, and 22·9 in Wakefield.

The 4368 deaths from all causes in the 96 towns were 397 fewer than the number in the previous week, and included 325 which were referred to the principal epidemic diseases, against 388 and 381 in the two preceding weeks. Of these 325 deaths, 137 resulted from measles, 71 from infantile diarrhœal diseases, 65 from whooping-cough, 26 from diphtheria, 22 from scarlet fever, and 4 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases last week did not exceed 0·9 per 1000, against 1·1 in each of the two preceding weeks. The deaths attributed to measles, which had been 141, 149, and 151 in the three preceding weeks, declined to 137 last week, and caused the highest annual death-rates of 1·7 in Stoke-on-Trent, 2·2 in Wolverhampton and in Salford, 2·7 in Wimbledon, 3·1 in St. Helens, and 4·5 in Walsall. The deaths of infants (under two years of age) referred to diarrhœa and enteritis, which had been 56, 75, and 79 in the three preceding weeks, fell to 71 last week, and included 23 in London, 4 in Liverpool, and 3 in Stoke-on-Trent, in Manchester, and in Preston. The fatal cases of whooping-cough, which had been 80, 94, and 83 in the three preceding weeks, further declined to 65 last week; of this number 19 occurred in London, 5 in Liverpool, 4 in Hull, 4 in Newcastle-on-Tyne, and 3 in Stoke-on-Trent, in Manchester, and in Leeds. The deaths attributed to diphtheria, which had been 37, 39, and 40 in the three preceding weeks, fell to 26 last week, which was the lowest number recorded in any week of the current year; 3 deaths were registered in London, 3 in Manchester, and 2 each in Edmonton, Portsmouth, Bradford, and Bolton. The deaths referred to scarlet fever, which had been 14, 22, and 16 in the three preceding weeks, rose to 22 last week, and included 3 in Birmingham, 3 in Salford, 2 in Manchester, and 2 in Middlesbrough. The fatal cases of enteric fever, which had been 9, 9, and 12 in the three preceding weeks, declined to 4 last week, which was the lowest number of deaths from this disease recorded in any week of the current year, and were registered in Nottingham, Stockport, Wallasey, and Manchester respectively.

The number of scarlet fever patients under treatment in the Metropolitan Asylums and the London Fever Hospital, which had increased from 1334 to 1403 in the four preceding weeks, had further risen to 1411 on Saturday last; 171 new cases of this disease were admitted during the week, against 185, 216, and 206 in the three preceding weeks. These hospitals also contained on Saturday last, 789 cases of diphtheria, 598 of measles, 300 of whooping-cough, 34 of enteric fever, and 1 of small-pox. The 1038 deaths from all causes in London were 137 fewer than the number in the previous week, and were equal to an annual death-rate of 12·0 per 1000. The deaths referred to diseases of the respiratory system, which had been 245, 255, and 210 in the three preceding weeks, further declined to 197 last week, but were 30 in excess of the number recorded in the corresponding week of last year.

Of the 4368 deaths from all causes in the 96 towns, 163 resulted from various forms of violence and 349 were the subject of coroners' inquests. The causes of 36, or 0·8 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Leeds, Bristol, West Ham, Bradford, Portsmouth, Salford, Leicester, and in 64 other smaller towns. Of the 36 uncertified causes of death last week, 6 were recorded in Birmingham, and 2 each in Stoke-on-Trent, Liverpool, St. Helens, Bury, Preston, and South Shields.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,259,600 persons at the middle of this year, 1174 births and 719 deaths were registered during the week ended Saturday, May 10th. The annual rate of mortality in these towns, which had been 17·7, 17·3, and 17·2 per 1000 in the three preceding weeks, further declined to 16·6 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these Scotch towns averaged 17·2, against 14·9 per 1000 in the 96 large English towns during the same period. Among the several towns the annual death-rates during the week ranged from 6·0 in Kilmarnock, 9·2 in Ayr, and 11·0 in Clydebank, to 18·0 in Coatbridge, 22·8 in Aberdeen, and 23·8 in Perth.

The 719 deaths from all causes were 27 fewer than the number in the previous week, and included 106 which were referred to the principal epidemic diseases, against 76 and 102 in the two preceding weeks. Of these 106 deaths, 45 resulted from whooping-cough, 30 from measles, 18 from infantile diarrhœal diseases, 9 from diphtheria, and 4 from scarlet fever, but not one from enteric fever or from small-pox. These 106 deaths from the principal epidemic diseases were equal to an annual death-rate of 2·4, against 1·1 per 1000 in the 96 large English towns. The deaths attributed to whooping-cough, which had been 39, 34, and 40 in the three preceding weeks, rose to 45, and included 26 in Glasgow, 4 in Edinburgh, 3 in Aberdeen, 3 in Motherwell, 2 in Paisley, and 2 in Hamilton. The deaths referred to measles, which had steadily increased from 8 to 32 in the five preceding weeks, slightly fell to 30, of which number 16 occurred in Aberdeen and 12 in Glasgow. The fatal cases of diarrhœa and enteritis (among infants under 2 years of age), which had been 9, 16, and 12 in the three preceding weeks, rose to 18, and included 11 in Glasgow and 5 in Dundee. The deaths attributed to diphtheria, which had been 8, 3, and 7 in the three preceding weeks, rose to 9, and comprised 6 in Glasgow, 2 in Aberdeen, and 1 in Perth. The 4 fatal cases of scarlet fever, of which 2 were recorded in Glasgow, were equal to the average in the four preceding weeks.

The deaths referred to diseases of the respiratory system, which had been 153, 119, and 118 in the three preceding weeks, further declined to 114 in the week under notice; 35 deaths resulted from various forms of violence, against 34 and 23 in the two preceding weeks.

In the 16 largest Scotch towns 1250 births and 711 deaths were registered during the week ended Saturday, May 17th. The annual rate of mortality in these towns, which had steadily declined from 17·7 to 16·6 per 1000 in the four preceding weeks, further fell to 16·4 per 1000 in the week under notice. During the first seven weeks of the current quarter the mean annual death-rate in these Scotch towns averaged 17·1, against 14·6 per 1000 in the 96 large English towns during the same period. Among the several towns

the annual death-rates last week ranged from 7·3 in Falkirk, 8·9 in Motherwell, and 11·0 in Clydebank, to 20·3 in Hamilton, 20·4 in Coatbridge, and 23·5 in Kirkcaldy.

The 711 deaths from all causes were 8 fewer than the number in the previous week, and included 89 which were referred to the principal epidemic diseases, against numbers steadily increasing from 72 to 106 in the four preceding weeks. Of these 89 deaths, 33 resulted from measles, 32 from whooping-cough, 12 from infantile diarrhœal diseases, 5 from scarlet fever, 5 from diphtheria, and 2 from enteric fever, but not one from small-pox. These 89 deaths from the principal epidemic diseases were equal to an annual death-rate of 2·1, against 0·9 per 1000 in the 96 large English towns. The deaths attributed to measles, which had been 18, 32, and 30 in the three preceding weeks, were 33 last week, and comprised 16 in Aberdeen, 13 in Glasgow, 3 in Dundee, and 1 in Falkirk. The deaths referred to whooping-cough, which had been 34, 40, and 45 in the three preceding weeks, fell to 32 last week, and included 18 in Glasgow, 8 in Edinburgh, 2 in Aberdeen, and 2 in Greenock. The fatal cases of diarrhœa and enteritis among infants (under 2 years of age), which had been 16, 12, and 18 in the three preceding weeks, fell to 12 last week, of which number 7 occurred in Glasgow. The 5 deaths attributed to scarlet fever, of which 3 were recorded in Glasgow, were equal to the average in the three preceding weeks. The 5 deaths referred to diphtheria were slightly below the average in the earlier weeks of this quarter; the 2 fatal cases of enteric fever were registered in Glasgow and Edinburgh respectively.

The deaths referred to diseases of the respiratory system, which had declined from 150 to 114 in the four preceding weeks, were 117 in the week under notice; 31 deaths were attributed to different forms of violence, against 23 and 35 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the 27 town districts of Ireland, with an aggregate population estimated at 1,199,180 persons at the middle of this year, 629 births and 443 deaths were registered during the week ended Saturday, May 10th. The annual rate of mortality in these towns, which had been 20·9, 21·3, and 18·5 per 1000 in the three preceding weeks, rose to 19·3 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these Irish towns averaged 21·0 per 1000; in the 96 large English towns the corresponding rate did not exceed 14·9, while in the 16 Scotch towns it was equal to 17·2 per 1000. The annual death-rate was equal to 20·4 in Dublin (against 13·6 in London and 17·5 in Glasgow), 17·1 in Belfast, 23·8 in Cork, 5·1 in Londonderry, 24·4 in Limerick, and 20·9 in Waterford, while in the remaining 21 smaller towns the mean death-rate was 20·9 per 1000.

The 443 deaths from all causes in the 27 Irish towns were 18 in excess of the number in the previous week, and included 26 which were referred to the principal epidemic diseases, against 24 and 19 in the two preceding weeks. Of these 26 deaths, 10 resulted from measles, 6 from scarlet fever, 5 from infantile diarrhœal diseases, 3 from enteric fever, and 2 from whooping-cough, but not one from diphtheria or from small-pox. These 26 deaths were equal to an annual death-rate of 1·1 per 1000, coinciding with that recorded in the 96 English towns, while the corresponding rate in the 16 Scotch towns reached 2·4 per 1000. The deaths attributed to measles, which had been 18, 5, and 4 in the three preceding weeks, rose to 10 in the week under review, and included 5 in Wexford and 2 in Belfast. The deaths referred to scarlet fever, which had averaged 3 in the five preceding weeks, rose to 6, all of which occurred in Belfast. The deaths of infants (under 2 years of age) from diarrhœa and enteritis, which had been 10, 7, and 7 in the three preceding weeks, further declined to 5, of which 3 were recorded in Dublin. The 3 fatal cases of enteric fever, which were slightly in excess of the average in recent weeks, were registered in Dublin, Belfast, and Limerick respectively. The 2 deaths referred to whooping-cough, which were equal to the number in the previous week, occurred in Dublin and Bray respectively.

The deaths referred to diseases of the respiratory system, which had been 92, 97, and 97 in the three preceding weeks, were 94 in the week under notice. Of the 443 deaths from all causes, 132, or 30 per cent., occurred in public institutions, and 6 resulted from different forms of violence. The causes of 19, or 4·3 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest; in the 96 large English towns the proportion of uncertified causes of death was 0·8 per cent.

In the 27 town districts of Ireland 642 births and 416 deaths were registered during the week ended Saturday, May 17th. The annual rate of mortality in these towns, which had been 21·3, 18·5, and 19·3 per 1000 in the three preceding weeks, fell to 18·1 per 1000 in the week under notice. During the first seven weeks of the current quarter the mean annual death-rate in these towns averaged 20·6 per 1000; in the 96 large English towns the corresponding rate did not exceed 14·6, while in the 16 Scotch towns it was equal to 17·1 per 1000. The annual death-rate last week was equal to 17·9 in Dublin (against 12·0 in London and 17·4 in Glasgow), 18·2 in Belfast, 21·1 in Cork, 14·0 in Londonderry, 9·5 in Limerick, and 20·9 in Waterford, while in the remaining 21 smaller towns the mean death-rate was 19·3 per 1000.

The 416 deaths from all causes in the 27 Irish towns were 27 fewer than the number in the previous week, and included 30 which were referred to the principal epidemic diseases, against 19 and 26 in the two preceding weeks. Of these 30 deaths, 10 resulted from measles, 7 from infantile diarrhœal diseases, 4 from scarlet fever, 4 from whooping-cough, 3 from enteric fever, and 2 from diphtheria, but not one from small-pox. The annual death-rate from these epidemic diseases last week was equal to 1·3 per 1000; in the 96 large English towns the corresponding rate did not exceed 0·9, while in the 16 Scotch towns it reached 2·1 per 1000. The deaths attributed to measles, which had been, 5, 4, and 10 in the three preceding weeks, were again 10 last week, 5 of which occurred in Wexford. The deaths of infants (under 2 years of age) referred to diarrhœa and enteritis, which had fallen from 11 to 5 in the six preceding weeks, were 7 last week, and comprised 5 in Dublin and 2 in Belfast. The 4 fatal cases of scarlet fever were equal to the average in the earlier weeks of the quarter, and were all registered in Belfast. The 4 deaths attributed to whooping-cough were also equal to the average in earlier weeks, and comprised 3 in Dublin and 1 in Waterford. The 3 deaths referred to enteric fever were recorded in Belfast, Limerick, and Kilkenny respectively, and the 2 fatal cases of diphtheria in Dublin and Belfast respectively.

The deaths referred to diseases of the respiratory system, which had been 97, 97, and 94 in the three preceding weeks, fell to 78 in the week under notice. Of the 416 deaths from all causes, 134, or 32 per cent., occurred in public institutions, and 9 resulted from different forms of violence. The causes of 13, or 3·1 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest; in the 96 large English towns the proportion of uncertified causes of death did not exceed 0·8 per cent.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

The Director-General.

Surgeon-General Arthur William May, C.B., Director-General of the Medical Department of the Navy, has been granted the relative rank of Vice-Admiral in His Majesty's Fleet (dated May 11th, 1913).

In accordance with the provisions of Order in Council of April 1st, 1881, Deputy Surgeon-General William Tait has been placed on the Retired List at his own request (dated May 6th, 1913).

ROYAL ARMY MEDICAL CORPS.

Captain Charles G. Thomson to be Major (dated May 3rd, 1913).

School of Army Sanitation.—Brevet-Major Arthur B. Smallman to be Assistant Instructor (dated March 3rd, 1913).

Colonel R. J. Geddes, D.S.O., has arrived home for duty from Jubbulpore. Colonel R. H. S. Sawyer has been appointed Assistant Director of Medical Services to the Headquarters Staff tour.

Lieutenant-Colonel H. E. Cree has been appointed to command the Military Hospital at Sialkot Cantonment. Lieutenant-Colonel R. H. Penton, D.S.O., has taken over charge of the Military Hospital at Ranikhet Cantonment. Lieutenant-Colonel H. M. Thompson, D.S.O., has arrived home from India on eight months' leave of absence. Lieutenant-Colonel J. D. Ferguson, D.S.O., has relinquished the appointment of Medical Inspector of Recruits in the Eastern Command. Lieutenant-Colonel A. W. Bewley has taken up duty at York. Lieutenant-Colonel L. Way has been appointed to hold charge of the Military Hospital at Ferozopore Cantonment. Lieutenant-Colonel R. Holyoake, at present serving at Sheerness, has been placed under orders for a tour of service abroad during the coming trooping season.

Major A. Chopping has been placed under orders for transfer from the Royal Herbert Hospital at Woolwich to the Royal Victoria Hospital at Netley. Major G. J. Buchanan has been appointed Medical Inspector of Recruits to the Eastern Command, in succession to Lieutenant-Colonel J. D. Ferguson, D.S.O. Major P. S. O'Reilly has arrived home on leave of absence from India. Major J. Hennessy has left Cosham for a tour of duty at the Military Hospital, Colaba, Bombay. Major H. A. Hinge has taken up duty at Aldershot. Major R. T. Brown has been appointed to command the Military Hospital at Darjeeling Cantonment. Major T. E. Fielding has been transferred from the London District to the Southern Command. Major R. McK. Skinner has arrived home from the Straits Settlements. Major A. D. Waring has been appointed to the Military Hospital at Hilsea. Major C. J. O'Gorman has been granted six months' leave of absence home from India on medical certificate. Major L. Addams-Williams has been placed under orders for a tour of foreign service. Major T. J. Potter has arrived home on leave of absence from Egypt. Major R. S. H. Fuhr, D.S.O., has been selected for appointment on the Surgical Staff of the Royal Arsenal at Woolwich. Major J. H. R. Bond has been transferred from Nowgong Cantonment to the Military Hospital at Naini Tal. Major E. E. Parkes has been placed under orders for service abroad.

Captain T. E. Harty has been appointed Specialist in Dermatology and Venereal Diseases to the Military Hospital at York. Captain H. Stewart has arrived home for duty from India. Captain M. P. Leahy on arrival in Ireland has been appointed to the Dublin District for duty. Captain F. D. G. Howell has taken up duty in the Western Command. Captain W. H. Forsyth has arrived home from the South African Command. Captain A. L. Otway has been transferred from the Military Hospital at Londonderry to Salisbury. Captain H. Harding has been appointed to the Military Hospital at Colchester. Captain P. Farrant has left Topsham for a tour of duty on the West Coast of Africa. Captain A. S. Williams has arrived home for duty from Nowshera Cantonment. Captain W. Wiley has been placed under orders for a tour of service abroad. Captain R. L. V. Foster has been appointed to hold medical charge of the Military Hospital at Crownhill. Captain M. F. Grant has taken up duty as Adjutant to the First London Division School of Instruction, R.A.M.C. Captain D. F. Mackenzie has been appointed Staff Surgeon at Headquarters of the Seventh (Meerut) Division. Captain R. C. G. M. Kinkead has joined the Military Hospital at Bloemfontein. Captain T. C. Lucas has been appointed Surgeon to the Governor of Bombay Presidency. Captain E. W. M. Paine has taken over duty at Pembroke Docks. Captain T. W. O. Sexton has been appointed to the Eastern Command. Captain J. C. Hart has arrived home for duty from Peking. Captain D. G. Carmichael has left Glencorse for a tour of service in India. Captain P. C. T. Davy has been transferred from the Military Hospital at Chatham to Gravesend. Captain A. A. Sutcliffe has taken up duty at the Military Hospital, Chester. Captain W. A. Spong has been appointed Staff Surgeon and Embarkation Medical Officer at Karachi. Captain M. Sinclair has been appointed in medical charge at Chelsea Barracks. Captain G. H. Stevenson has been transferred from the Military Hospital at Sheffield to Lichfield.

Lieutenant T. J. Hallinan has embarked for a tour of duty in India. Lieutenant C. H. H. Harold has been transferred from the Military Hospital at Rawal Pindi to Ambala Cantonment. Lieutenant S. J. Barry has taken up duty at Guildford. Lieutenant S. J. Higgins has joined at Fethard. Lieutenant W. A. Frost has been transferred from Devonport to India.

INDIAN MEDICAL SERVICE.

Lieutenant-Colonel C. Duer has been granted six months' extension of leave of absence home from India. Lieutenant-Colonel R. E. MacWatt has been appointed to officiate as First-class Civil Surgeon and Administrative Medical Officer to the Rajputana States. Lieutenant-Colonel H. B. Melville has been confirmed in the appointment of Chief Plague Medical Officer in the United Provinces of Agra and Oudh. Lieutenant-Colonel J. M. Crawford, civil surgeon at Benares, has been granted eight and a half months' leave of absence home from India.

Major F. S. C. Thompson has been permanently appointed to the Jail Department in Bengal Presidency. Major J. C. Robertson, Sanitary Commissioner to the Government of India, has been appointed an additional member of the Imperial Council. Major A. M. Fleming has taken up duty as Civil Surgeon at Jubbulpore. Major J. G. G. Swan has been transferred from Dalhousie to Jullundur and appointed Civil Surgeon. Major C. F. Wernman, officiating civil surgeon at Dinajpur, has been granted combined leave of absence and study leave home from India for two years. Major F. S. C. Thompson has taken up duty as Superintendent of the Juvenile Jail at Alipore. Major E. J. Morgan has been appointed to the Civil Medical Charge of Sitapur. Major C. C. Murison has been appointed to officiate as Civil Surgeon at Karachi.

Captain H. W. Illius has been appointed to officiate as Civil Surgeon at Rae Bareli. Captain J. D. Sandes has taken up duty as Resident Surgeon at the Government Medical College, Calcutta. Captain A. S. Leslie has been appointed to the Civil Medical Department in Madras Presidency. Captain S. C. Pal has relinquished medical charge of the Fategarh District. Captain V. B. Nesfield has been appointed to officiate as Chemical Examiner to the United Provinces of Agra and Oudh. The services of Captain H. C. Brown have been placed temporarily at the disposal of the Government of the United Provinces. Captain N. M. Wilson has been appointed Civil Surgeon at Mozuffergarh. Captain H. Halliday has taken up duty at Lyallpur as Civil Surgeon. Captain J. Smalley, on return from leave, has been appointed Civil Surgeon at Karwar.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

Captain Stuart G. McAllum to be Major (dated May 15th, 1913).

The undermentioned to be Lieutenants on probation: Cadet Herbert Stuart Griffith, from the London University Contingent, Officers Training Corps (dated April 21st, 1913). Cadet Lance-Corporal Christopher Atkinson, from the Edinburgh University Contingent, Officers Training Corps (dated April 26th, 1913).

The undermentioned Lieutenants are confirmed in their rank: William A. Miller, Malcolmson K. Nelson, Travis Hampson, and William O. Tobias.

TERRITORIAL FORCE.

Army Medical Service.

Lieutenant-Colonel Astley Vavasour Clarke, from the 5th Northern General Hospital, Royal Army Medical Corps, to be Colonel, on appointment as Assistant Director of Medical Services of the North Midland Territorial Division (dated May 10th, 1913).

Royal Army Medical Corps.

3rd West Riding Field Ambulance, Royal Army Medical Corps: Lieutenant-Colonel Thomas S. Adair, on the completion of his period of service in command of a field ambulance, is retired, and is granted permission to retain his rank and to wear the prescribed uniform (dated May 17th, 1913).

3rd London General Hospital, Royal Army Medical Corps: Harry Edwin Bruce Bruce-Porter (formerly Surgeon-Captain, Army Medical Staff) to be Lieutenant-Colonel in the permanent *personnel* (dated March 12th, 1913).

3rd Northern General Hospital, Royal Army Medical Corps: Lieutenant-Colonel John S. White, from the permanent *personnel*, to be Lieutenant-Colonel, whose services will be available on mobilisation (dated May 17th, 1913).

Attached to Units other than Medical Units.—Captain John W. Pridmore resigns his commission (dated May 21st, 1913).

For attachment to Units other than Medical Units.—Horsley Drummond (late Captain, 1st Northern General Hospital, Royal Army Medical Corps) to be Lieutenant (dated June 8th, 1912). Supernumerary Lieutenant William Reginald Margetts Turtle, from the 3rd East Anglian Field Ambulance, Royal Army Medical Corps, to be Lieutenant (dated May 17th, 1913). George William Mason to be Lieutenant (dated April 2nd, 1913). Alexander Cross Mallace to be Lieutenant (dated April 29th, 1913).

THE ROYAL AUSTRALIAN NAVY.

Mr. W. Edgar Roberts has been appointed Surgeon to H.M.A.S. *Australia*, flagship of the Royal Australian Navy.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

In the May issue of this journal Major S. L. Cummins and Major C. C. Cumming publish jointly a preliminary note on the results of their attempt at a differentiation of the staphylococci which they think may have a practical bearing on vaccine therapy, and Captain R. G. Archibald describes a case of kala-azar possessing a number of interesting features. Writing of sanatorium treatment in a paper on the diagnosis and management of early phthisis, Major W. S. Harrison says: "Hope is everything to a man with consumption, and I am not at all sure that a great deal of the good effect of a sanatorium does not depend on the fact that the patient feels that he has gone there to be cured, and that the things which the doctors are doing to him are done as part of a definite plan for bringing about that happy event." An interesting article is contributed by Colonel R. H. Firth on Medical Affairs during the Carnatic, Mysore, and Travancore Campaigns of 1760 to 1818. The conditions under which the predecessors of the Royal Army Medical Corps and Indian Medical Service served in at that period were very different from those which obtain at the present. Invitations to dinner were put into station and brigade orders, and surgeons were directed to keep their patients clean and allow each patient "about six feet of space" in hospital. It was also considered necessary in those days to give directions to surgeons when reporting on epidemics not to give opinions taken from books, but to give advice derived from experience. Colonel Firth, who has lately been delving in old records, also gives an account of a surgeon's kit in 1827, which makes quaint reading.

RED CROSS HOSPITALS.

Lieutenant-General Sir J. Spencer Ewart, Adjutant-General to the Forces, who was accompanied by Major M. H. G. Fell, a Deputy-Assistant Director-General of the Army Medical Service, and Colonel Thurston, of the Royal Army Medical Corps, made an inspection of a practical mobilisation at Camberley of the No. 2 Divisional Branch (Surrey) of the British Red Cross Society on May 12th. General Sir Spencer Ewart said that this year the War Office proposed to take a step forward in regard to work such as the British Red Cross Society was doing by establishing 14 nucleus clearing hospitals—one for each Territorial Division. They would be only nucleus hospitals for the present, with two officers and five men each, but he hoped they would prove centres to which the voluntary aid detachments could turn for guidance and look for help.

INDIAN MEDICAL SERVICE DINNER.

The annual dinner of the Indian Medical Service will be held at the Hotel Cecil, Strand, on Tuesday, June 10th, at 7.45 P.M. The Director-General, Surgeon-General the Hon. Sir C. P. Lukis, K.C.S.I., will preside, and the service will have the honour of entertaining as their guest the Marquis of Crewe, Secretary of State for India. Officers intending to be present should communicate without delay to the honorary secretary, Lieutenant-Colonel P. J. Freyer, 27, Harley-street, W.

THE board of management of the Metropolitan Convalescent Institution, 14, Victoria-street, S.W., announce that at the Home for Adults at Walton, near Weybridge, 24 beds are now provided for patients requiring surgical treatment after operation.

Correspondence.

"Audi alteram partem."

POST-GRADUATE STUDY IN PARIS.

To the Editor of THE LANCET.

SIR,—In starting next autumn a special course of post-graduate classes for the benefit of British medical men, Professor Widal's only aim is to offer in Paris the same opportunities as your fellow countrymen are used to finding in the German and Austrian schools. As I have lately pointed out in a meeting of the Medical Section of the Royal Society of Medicine, we are not out for an *entente cordiale* manifestation, with flags and banners, "Marseillaise," and *paroles immortelles*. We mean work.

If Sir William Osler's advice about studying in a foreign country is followed by any of your readers, here is an opportunity of availing themselves of the very best resources of the modern Paris school. I use the word "school" in the broad sense of the word, for this organisation has nothing to do with the University; it is worked privately in Widal's laboratories and wards. A schedule will be published in due time. Our programme includes: (1) clinical work and clinical teaching; (2) practical bacteriology as regards diagnosis; and (3) practical teaching of biological methods applied to clinical researches. The last part of the programme will include in particular the practical demonstration of Professor Widal's original methods. Every opportunity will be given to those who wish to study specialties, and hours will be arranged so that no time will be lost.

But as we want, more than anything else, to be practical and useful, I would feel most grateful to hear from those who may be interested in this new departure. Any advice, hint, or suggestion would be welcome. For instance, we are not quite sure about the suitable time to start this course (we suggest Oct. 15th). And we wonder if we should run it up to Christmas? It has also been suggested that the teaching should be done in English. Much may be said *pro et contra*. On this very important point I should like to hear from those who might be concerned.—I am, Sir, yours faithfully,

GUSTAVE MONOD, M.R.C.P. Lond., M.D. Paris.

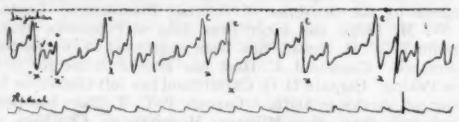
Vichy, May 17th, 1913.

THE JUGULAR PULSE AND THE BEGINNING OF DIASTOLE.

To the Editor of THE LANCET.

SIR,—The fundamental principles of cardiology rest upon the teachings of physiology, and it is a matter of first importance to those who are engaged in the pursuit of Dr. James Mackenzie's method of investigation that the time of events occurring in the cardiac cycle be precisely determined. The situation of the deflexion representing the start of the diastolic period in the jugular curve is a matter upon which some differences of opinion have been expressed.

In my paper on "The Jugular Pulse," published in THE LANCET of Jan. 25th, 1913, p. 239, I fixed the starting place of diastole at the fundus of the *x* depression, but I have been taken to task since by certain correspondents who regard



The declivity of the *c* wave is noticed in the above curve as descending to the fundus of the *x* depression unattended by a dicrotic appendage. This act of *c* ends systole and diastole begins.

diastole as beginning later in the curve, and an opinion appears to be prevalent that it commences as late as the end of the post-sphygmic period, and that its onset is marked by the declivity of the *v* wave.

The question can be decided only by an appeal to physiology. Diastole begins at the instant when ventricular muscle enters upon the phase of relaxation. Transition from a state of contraction to a state of relaxation is sudden, and

its precise time of appearance in the cardiac cycle is determinable by reference to a scale of intraventricular pressures. Commencement of the diastolic period is noted by Starling as occurring at the instant of the closing of the semilunar and aortic valves,[1] but since the closure of these valves results from an initial fall in intraventricular pressure, diastole must begin earlier, and in Hürthle's diagram appearing in the same work decline of intraventricular pressure is shown to begin one-thirtieth of a second before the closure of the valves. Consequently a point marking the commencement of diastole is situated a trifle to the left of the aortic notch in the carotid curve and one-tenth of a second later in the radial. In a diagram showing synchronised radial and jugular tracings, a vertical line drawn to cut through the arterial curve one-thirtieth of a second to the left of the aortic notch would strike the venous curve at the fundus of the *x* depression and in the part of it from which the base of the *v* wave is beginning to rise. This physiological survey confirms the statement on the subject made by me in "The Jugular Pulse."

Remarks in this paper in regard to the *c* wave have also received some criticism, but that perhaps is my own fault, as I had failed to mention the fact that the *c* wave is not a direct arterial impression, but an impression conducted from an arterial source by the venous column. That this is so, is plain because the deflexion representing *c* rises and falls with the venous column during respiratory movements. Whereas if the impression from the carotid or subclavian artery were made direct upon the tracing through the air of the receiver, the deflexion *c* would remain upon a stationary plane, independent of fluctuations in the level of the venous column.

I am, Sir, yours faithfully,

H. WALTER VERDON, F.R.C.S. Eng.

Streatham-hill, S.W., May 15th, 1913.

THE TREATMENT OF PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—Dr. N. D. Bardswell's paper [2] on the influence of the introduction of tuberculin treatment upon the sputum records of patients at the King Edward VII. Sanatorium has led me to send the following note which confirms his observations in a striking way. Tuberculin was introduced at the Kalyra Sanatorium in 1910, and the following table shows the influence it has had upon the disappearance of the tubercle bacilli from the sputum.

TABLE I.—*Sputum Records of 291 Consecutive Patients (all Classes) Treated with Sanatorium Treatment and Tuberculin.*

Year.	Number of patients.	Lost T.B.	Percentage.
1910	89	32	35·96
1911	91	26	28·57
1912	111	34	30·63
Total ...	291	92	31·3

TABLE II.—*Sputum Records of 335 Consecutive Patients (all Classes) Treated with Sanatorium Treatment Alone.*

Year.	Number of patients.	Lost T.B.	Percentage.
1907	92	15	—
1908	120	28	—
1909	123	24	—
Total ...	335	67	20

The evidence of the above tables is remarkably similar to that adduced by Dr. Bardswell, as will be seen in the following comparative table.

TABLE III.—*Percentage of Patients that lost T.B.*

—	Sanatorium alone.	Sanatorium and tuberculin.	Increase.
Bardswell ...	21·7 per cent.	34 per cent.	12·3 per cent.
Reissmann ...	20 ,, ,,	31·3 ,, ,,	11·3 ,, ,,

Since the introduction of tuberculin at the Kalyra Sanatorium the 20 per cent. of cases that lost their T.B. on sanatorium treatment alone has been increased to 31·3 per cent., an increase of 11·3 per cent., a result which closely approaches the increase obtained by Dr. Bardswell—viz., 12·3 per cent.

If we apply the same comparative test to the early cases treated at the King Edward VII. Sanatorium and at the Kalyra Sanatorium respectively, the result is equally striking. The Kalyra figures include 66 patients treated by sanatorium only, and 80 patients on sanatorium and tuberculin.

TABLE IV.—*Percentage of Patients (Class I.) that Lost T.B.*

—	Sanatorium alone.	Sanatorium and tuberculin.	Increase.
Bardswell ...	50 per cent.	66·6 per cent.	16·6 per cent.
Reissmann ...	62·1 ,, ,,	78·7 ,, ,,	16·6 ,, ,,

It is sometimes difficult to decide whether a case should be included in Class I. or Class II. Turban. At the Kalyra Sanatorium, perhaps, the selection of first-class cases is unusually strict; a visit which I recently made to many sanatoriums in Europe leads me to think so. If this is so, then the apparently better results in this class obtained at Kalyra over those at the King Edward VII. Sanatorium is accounted for.

The remarkable fact is that the increase in the percentage of early cases that lost T.B. on sanatorium treatment and tuberculin over those on sanatorium treatment alone is identical at both the King Edward VII. Sanatorium and at the Kalyra Sanatorium—namely, 16·6 per cent. The patients included in the above tables received a mixture of Old Tuberculin (Koch) and New Tuberculin T.R. (concentrated), equal parts. The maximum dose given is 0·5 c.c. T.O. and 0·5 c.c. T.R., and the minimum dose 10−5 c.c., 10 to the power of minus five times this quantity. The higher dilutions are given twice a week until the dose 10−3 c.c. of the mixture is reached; it is then given once a week or at greater intervals. The dose is not increased until no reaction follows the injection. The sputum—when such is present—is received in sterilised vessels. It is centrifugalised if the first examination fails to reveal T.B. Antiformin is not used. New glass slides are used for each examination.

I am, Sir, yours faithfully,

C. REISSMANN, M.A., M.D. Cantab., B.Sc., M.R.C.P. Lond.,

Physician, Kalyra Sanatorium, South Australia; Honorary Physician, Consumption Wards, Adelaide Hospital.

R.M.S. *Orsova*, Indian Ocean, April 14th, 1913.

NATIONAL MEDICAL GUILD.

To the Editor of THE LANCET.

SIR,—At a meeting of the council of the National Medical Guild held on May 7th, it was decided to ask you to publish the following particulars of the guild.

The guild is a trade union for medical practitioners and is run on trade union lines—i.e., its main policy is the defence of its members by all legal means. It has, of course, as a trade union immunity from many actions under the conspiracy and libel laws; this is absolutely essential for the protection of its funds and for the success of any combined action on the part of the medical profession, and such immunity can only be obtained by a trade union. The guild has already successfully contested the case of Heard *v.* Pickthorne, with the result that it is now illegal for societies to

[1] Physiology, Fig. 3, p. 214.
[2] THE LANCET, March 15th, 1913, p. 750.

refuse non-panel doctors' certificates for the purposes of sickness benefit. This was a very extensive and injurious practice previous to this decision. It is establishing branches in all parts of the United Kingdom.

The subscription is £1 1*s.* per annum, and cheques should be made payable to the National Medical Guild. Medical practitioners are eligible whether on the panel or not, and in view of the fact that the Government are now considering the inclusion of dependants of the insured under the Act in the provisions for medical benefit, it is hoped that those who have not previously had an opportunity of joining will do so now. The terms which the Government have under consideration are such that it is certain that every effort of the profession will be required to ensure any approach to reasonable treatment.—I am, Sir, yours faithfully,

GORDON R. WARD,
Organising Secretary.

34, Villiers-street, Strand, W.C., May 15th, 1913.

INDICATIONS OF NERVE LESION IN CERTAIN PATHOLOGICAL CONDITIONS OF BLOOD-VESSELS.

To the Editor of THE LANCET

SIR,—In my article with the above title,[1] reference 7 to a previous paper of mine was not furnished with the name of the journal in which the said paper is about to appear. As I consider it very important in the present connexion I shall be glad if you will let me add that the reference should read thus: 7. "Blood-vessel Changes Consequent on Nervous Lesions," *Journal of Nervous and Mental Disease*, 1913.

I am, Sir, yours faithfully,

T. WINGATE TODD.

Western Reserve University, Cleveland, Ohio, U.S.A., May 10th, 1913.

THE CIVIL PRACTITIONER IN WEST AFRICA.

To the Editor of THE LANCET.

SIR,—Yellow fever having again broken out on the coast of West Africa, an Order in Council under section 18 of the Infectious Disease Act Ordinance, 1908, is making regulations. The Governor, with the advice of his executive council, makes certain regulations, No. 3 of which states that "no authority for burial of persons who have died within certain areas shall be given by the registrar of deaths unless application be accompanied by a certificate from a Government medical officer." Therefore the civil practitioner is immediately placed on the same level as the "Comfo," "juju" and "Obi man." Surely this is not only unjust and tyrannical, but certainly not in the spirit of the Act of Registration.

Although Clause No. 3 is at present confined to a certain district, there is nothing to prevent it being put into force all over the coast. Any case, therefore, that the Government medical officers arrogate unto themselves the right to diagnose, as yellow fever, no outside medical man is allowed to differ from them. In a country like this, where we get so many cases of different fevers, it can be seen how easily Government medical officers especially interested in some particular fever can make a mistake, and there is no body to question their opinion or diagnoses.

Many men come out here in the Government service who are novices in tropical medicine and have never seen a case of yellow fever; still it is left to their decision, and no civil practitioner, however long and varied his experience in tropical countries, is allowed to issue a death certificate except viséd by a Government medical officer.

When any information is required in outside districts the Government medical man often avails himself of the civil medical man's knowledge, and continually sends forms, &c., to be filled up relating to health, disease, death-rate, &c., of district, but no fee is attached. Naturally to the layman, when he hears that civil practitioners are debarred from giving death certificates, it appears strange, and he is tempted to jump to the conclusion that there is a difference. Indeed, only a few days ago, a very intelligent clerk here said, "I suppose we will soon have a real doctor," and when asked what he meant, said, "Oh, a Government man."

In conclusion, I hope the General Medical Council will take the question up, as such laws are most detrimental to the *locus standi* of the civil medical man.

I am, Sir, yours faithfully,

J. E. ST. GEORGE QUEELY, L.R.C.P. Irel., &c.,
Civil Medical Officer, Ashanti Rivers and Concessions, formerly Government Medical Officer, North Queensland.

Gold Coast Colony, West Africa, April 16th, 1913.

[1] THE LANCET, May 17th, 1913, p. 1371.

MEDICAL PRACTICE UNDER THE INSURANCE ACT.

(BY OUR SPECIAL COMMISSIONER.)

(*Continued from p. 1420.*)

X.—MOTHERWELL AND THE SCOTTISH METAL WORKERS.

Wages of Insured Workers above Income-tax Limit.

ACCORDING to the last estimate the borough of Motherwell has 40,373 inhabitants, and it is celebrated for its iron and steel works. Close to Glasgow and its great seaport, with extensive coal mines near to hand, Motherwell has become a very important industrial centre. Having seen something of the effects of the National Insurance Act among the coal-mining and the agricultural populations, I proceeded to Motherwell to ascertain what was the position among metal workers.

One of the iron-steel works at Motherwell employs about 4000 men. At another establishment, called the Bridge Works, several hundred men drill, finish, and fit the huge pieces of metal with which modern bridges are built. Then the Lanarkshire Steel Company has 1500 workmen, while some 1500 to 1800 more men find active employment in wagon-building. From the economic point of view an important point to be noted is that there are fewer married men among the steel workers than even among the miners, though some of them earn what are admittedly high wages. I heard of one man who was earning by the bonuses which he receives on the work done under his supervision as much as £40 a week. Now this may have been a fable, but it is quite a common thing for a steelworker to make £10 in a week. They are, of course, exceptional men, and must not be taken as examples upon which to found any deduction about wage rates. Gifted with bodily strength, and capable of great endurance in the heat of the furnaces, they have also to display both much alacrity and intelligence. This exceptional pay is generally earned by piecework. Now, in regard to insurance, though these men pay income-tax, for they earn large sums, they are nevertheless insured persons. Undoubtedly they are workmen. They earn their living by the labour of their hands, and deserve all the money they can get, but it is an anomaly that citizens earning such incomes should obtain medical aid under the cheap contract system established by the National Insurance Act. Apart from all sensational or exceptional cases of earning, the numerous manual workers who earn much more than £160 a year have the money for insurance under the Act deducted from their wages. Yet if a clerk employed at the same works earns a salary of more than £160 no such deduction is made, and he cannot obtain medical attendance under the Act. As such abuse remained unchallenged I was not surprised to find that it was quite impracticable to raise the question of a wage limit at Motherwell. There is no middle or upper class in this hard-working community, and there is little or no poverty. The medical profession does not enjoy the usual social advantages in such a place. There is nothing to do but work—the work is necessarily stereotyped as well as hard—and money is the only reward attainable. Such a situation very well explains why the Act has been, and, in spirit at any rate, still is opposed by many medical men. Those who are anxious for the honour of their profession see in the reduction of numerous medical men to the status of mere fee-earners a threat to the whole progress of medicine as well as to the *morale* of the professional life.

The Former Fight with the Friendly Societies.

Friendly Societies had many members at Motherwell. Of the 15,000 persons now insured under the Act, fully a quarter belonged to Friendly Societies. As a rule, the members of these societies only paid 2*s.* 6*d.* a year for medical attendance, though a few gave 3*s.* About nine years ago the medical officers came to an agreement among themselves and simultaneously asked for 4*s.* a year. The Friendly

Societies refused to consider the application, and at once advertised for new medical officers. They obtained no less than 79 applicants. As nearly all the practitioners in Motherwell had lodges, this did not bring in a large sum of money for any one practitioner. The annual amounts varied from £30 to £70 a year. But all these small sums, when put together, made a large total for the one practitioner whom the Friendly Societies imported, who when he came was boycotted. Matters stood thus when the National Insurance Act first started on its career as a Bill in Parliament. In face of the greater danger created by the introduction of the Bill, a local medical society was formed, for all were determined to fight, and to fight as one man. The medical officer to the Friendly Societies joined the medical society and resigned his position as medical officer of the lodges. The members of the Friendly Societies, in the exercise of their choice of doctor, show that they resent their medical officer leaving them, for I am told he has not had the number of names on his list as a panel doctor that he might have expected. But as there are about 3000 insured persons in the district who last April had not yet selected a panel doctor, perhaps allotment of some of these will make up the deficiency. Nor do these 3000 insured persons represent bad lives. On the contrary, they are such good lives, it is said, that they have not taken the trouble to select a medical attendant. There have been no refusals of bad lives. The doctor who refused patients would get a bad name. The news soon goes round.

Privileged Position of the Works Doctors.

At Motherwell, among the metal workers, as in colliery districts among the miners, the "works doctor" has been in existence for many years. At the great works enumerated above and many others the men, bachelors as well as married men, paid 3*d*. a week. This used to be deducted from their wages free of charge and paid over to the works doctor. Thus there was security of payment and no expense for management. It has been stated—but I have no proof of the accuracy of the figures given—that in some of the iron-steel works 60 per cent. of the workers are not married, and there was a large proportion of young men who belonged to the Friendly Societies and who also paid for the works doctor. They consequently paid twice over for medical attendance, but this was done voluntarily. Before the Act came into force the 3*d*. a week for the works doctor was a compulsory condition of employment, and included, as with the miners, medical attendance on the families and medicine. There was no free choice of doctor, but when a vacancy occurred the workmen contributors elected by vote their new works doctor. The appointment thus made was permanent, and in some cases was a very valuable appointment. Indeed, it is said that one works doctor made nearly £3000 a year, which proves he had many more persons on his list than should be allowed. There can be no doubt that the 3*d*. a week deducted at the works was the backbone of medical practice at Motherwell, and to-day the Act has rendered good service by breaking down the privileged position some practitioners had acquired by being appointed works doctors. When the capitation fee under the Act was considerably augmented, the resistance, which had been very determined, at once changed into approval, and the practitioners of Motherwell willingly joined the panel. There are nine firms and 16 practitioners in this borough, and by Jan. 2nd all the 16 members of the profession were on the panel. Several assistants became partners so as to meet the Act.

Increase of Medical Incomes.

The Act, however, has not done away with the deduction on wages at the works for medical attendance on the dependents of insured persons; only the amount is now reduced from 3*d*. to 2*d*. Of this 2*d*., ½*d* is allotted to cover the cost of medicine and the 1½*d*. pays for medical attendance on the wives and children. To-day a man may choose according to the Act a panel doctor for himself and another doctor for his family as provided by the 2*d*. paid outside the Act. But as all the practitioners without exception are on the panel this is rarely done. In any case and for either service the patients have absolute freedom in their choice of medical attendant, and thus the privileged positions as works doctors acquired in the past have been broken up. If some practitioners, as is the case with the colliery surgeons, stand to lose, the profession, as a whole, is obviously receiving better remuneration. The medical practitioners used to get 13*s*. a year, from which 2*s*. 2*d*. was deducted for medicine. As for every two adult males one was reckoned to be married with an average family of five, this meant for the metal workers as for the miners 26*s*. a year for medical attendance and medicine for six persons, or 21*s*. 8*d*. without medicine. To-day the medical profession receives from the three different sources provided by the Act 14*s*. a year for the two adult males. Then it receives, for the family of the one adult male, 2*d*. a week from each male, making 17*s*. 4*d*. a year. Out of this latter sum ½*d*. a week is deducted for drugs. The bachelor who gets his medicines under the Act has not, I presume, to pay the ½*d*. for the medicines he does not receive at the cost of the Works Fund. In that case 15*s*. 2*d*. remains for medical attendance, which, added to the 14*s*. under the Insurance Act, make a total of 29*s*. 2*d*. for medical attendance, without medicine, on six persons, where formerly only 21*s*. 8*d*. were received. The work also, by the free choice of doctors now secured, is more evenly distributed. Some practitioners are getting less, others more patients than formerly, but the profession, as a whole, is better paid. It may be said, therefore, that the practitioners at Motherwell are satisfied. Of course, there is the usual complaint as to the excessive and useless amount of clerical work. The day-book, even with the newly proposed modifications, which only take off two questions, is denounced as of no scientific value; clumsy and of little use in the absence of an index. Details are only wanted when an insured person is drawing sick pay. If the patient came a week or so ago, all the names inscribed since then must be read through till his name is found. The names should be entered alphabetically. Then there is no guarantee that the day-book is accurately kept. The "A" for advice and the "V" for visit can be dotted about as fancy may dictate. Through no dishonesty of purpose, but merely yielding to stress and hurry, these notes are often only approximately accurate. The really important fact needed seems to be the date when an insured person signs on for sick benefit and when he signs off.

Roman Catholic Practitioners Benefit by the Act.

While it is freely recognised that for contract practice more money will now be collected, some private practice among the better sections of the working class will be lost. In the works 75 per cent. or more of the workmen availed themselves of the services of their works doctor. But there was always a small minority who occasionally resorted to a doctor of their own choice. They would then pay 1*s*. for advice at his surgery or 2*s*. a visit. This did not include medicine. Now these men need not wait for some special occasion to fetch the medical adviser they prefer, for he is on the panel, and the workman has only to select him from the first. This loss of fees, arising from individual preferences, may be considerable to the old-established practitioners. Many workmen's families from whom 15*s*. to 30*s*. might be obtained in the course of a year will secure the doctor they prefer from the panel and are not likely to pay any more private fees. Another disadvantage of the Act, so far as the old-established practitioners are concerned, is that it has introduced Roman Catholic competitors, who, with the free choice of doctor, can now count on Roman Catholic support. Formerly the Roman Catholic workman had to be content with his works or his club doctor. Now, if there is a doctor of his creed on the panel he can select him; and two Roman Catholic doctors have established themselves at Motherwell in consequence of the Act. They are very successful, and their competition will be felt by the older practitioners.

Medical Aid Society Frustrated.

The payment for medical attendance on families has proved advantageous where bachelors are numerous and pay the same sum as the married men. But this is not the case in all trades. At the gasworks the men are nearly all married, and among the railway servants the unmarried men will not pay the same as their married colleagues. Consequently several sections of railway workers were refused by the doctors, and they have to pay the usual fees for medical attendance. As an alternative scheme, which, however, has not been accepted, it was proposed that bachelors who are under the Act need not pay anything at all for dependents, married men alone paying the 4*d*. per week for medical attendance and medicine for their families. This was thought rather hard on the married men,

particularly as it had been customary for the bachelors to help to bear this burden. In view of all these difficulties some workmen decided on an attempt to exploit the Act in their favour by founding a medical aid society run on cheap lines. The idea was to pretend that this society was a continuation of one that had existed before and could be authorised under Section 15 (4) as a system for providing medical attendance. Therefore the society, and not its medical officers, was to receive the money collected for medical service under the Act. On its side, the society proposed to pay its medical officers 13*s.* a year for attendance on members who were insured persons and their families. In the House, and in answer to a question, Mr. Masterman had said that the Regulation for medical benefit would permit the continuation of works doctors as a system. However, the secretary of the Motherwell Provisional Medical Committee, Mr. Thomas Ormiston, who is a solicitor, asked that the body he represents should be heard, and thereupon an official inquiry was held at the town hall. Mr. James Leishman, chairman of the Scottish Insurance Commissioners, came from Edinburgh to preside. He was accompanied by Dr. J. R. Currie, chief medical adviser, and Mr. J. M. Vallance, legal adviser. The inquiry was held on Jan. 7th and lasted two and a half hours. There was no dispute as to the facts of the case. Mr. Ormiston very clearly showed that the "Workers' Medical Association" it was now proposed to establish would in no wise be a continuation of a system existing before the Act. Works doctors existed before the Act, but they only attended to persons actually employed at the works and their families, whereas it was now decided to include many others who previously had not been attended by works doctors and who were not, in the past or the present, attached to any works. Then with the works doctors there was no committee of management, but the Workers' Medical Association it was now proposed to form would have a committee of management. The workers would set up another insurance committee of their own and it would be a rival to the Insurance Committee established by the Act.

Threepence a Year for Attending Families.

Financially the scheme of the Workers' Medical Association would result in the medical officers receiving 3*d.* per annum for attending the families of insured persons. Even this was to be obtained only on condition that half the adult male population abstained from matrimony. Mr. Ormiston explained this to the Commissioners in the following manner. Including the extra or "floating" 6*d.*, the special tuberculosis 6*d.* and drugs, the Act set apart 9*s.* for the medical attendance and treatment of every insured person. The Workers' Association proposed to give 13*s.* for each insured person and the average of two and a half dependents. But the chemists had formed themselves into an association and had decided that dependents must pay the same rate for medicines as insured persons. As the rate for drugs was 1*s.* 6*d.* per annum for the insured, this meant 3*s.* 9*d.* for the two and half dependents per insured person. Adding the 9*s.* which the doctors and chemists would get under the Act to this 3*s.* 9*d.*, and subtracting it from the 13*s.*, the Workers' Medical Association thus left only 3*d.* per annum for attendance on the wife and children of insured persons. The Insurance Commissioners retired without pronouncing a verdict, but a hint was given which resulted in the Workers' Medical Association withdrawing their application. This was a great victory for the medical profession, and all concerned were loud in their praise of the skill shown by their legal secretary, Mr. Ormiston. Nor is this a merely local matter. The result has affected the whole of Scotland. The fact that a pretended "medical institution or system existing before the Act" could not be established at Motherwell has prevented other similar bodies arising elsewhere. It was only when the attempt to form the Workers' Medical Association had failed that the agreement, described above, for 2*d.* a week for the families of insured persons was concluded. But the whole question of the families of the insured, complicated by the rising claims of the pharmacists, is far from being definitely settled. As this matter is not met by the law, the members of the medical profession keenly feel the need of a strong medical union that would enable them to stand on a footing of equality when negotiating with the organised working classes. With no reserve funds, no recognised leaders, and no real discipline they are at great disadvantage when attempting to come to some agreement with a powerful and well-disciplined trade union.

(To be continued.)

DISPENSING ERRORS AND ADMINISTRATIVE SAFEGUARDS FOR THEIR PREVENTION.

(FROM A CORRESPONDENT.)

Now that prescribing on an extensive scale has become compulsory as a corollary to National Insurance, the absence of certain safeguards for prescriber and dispenser alike will be felt more acutely, and it may be opportune to draw attention to a defect which can be remedied at no distant date—in the forthcoming new edition of the British Pharmacopœia.

The pharmacist is frequently confronted by an unusually high dose in a prescription, and in the absence of any definite rules regulating his line of conduct in such cases his position may be most embarrassing. It may have been the prescriber's intention to administer a particularly heroic dose, and in such a case an inquiry might be resented as savouring of criticism. On the other hand, he may have made a mistake—*errare humanum est*—but circumstances may occur which preclude an inquiry, and the medicine is dispensed. It is not the pharmacist's duty to question the medical practitioner's method of prescribing; still cases may arise when the dosage is such as to cause the dispenser a certain amount of uneasiness and anxiety, which might be avoided by the provision of suitable safeguards for both parties, such as exist in other countries where dispensing by medical men has long been abolished, and the pharmacist is the sole purveyor of drugs to the public.

Procedure in Various Countries.

The pharmacopœias of most foreign countries contain a table of maximum doses, in which the maximum single, as well as daily, dose (i.e., total amount administered during 24 hours) of the official potent drugs and preparations is laid down. These doses do not represent the limit by any means, they merely indicate the maximum therapeutic dose in usual employment, and the prescriber is naturally at liberty to exceed these if he sees fit. The object of these tables, however, is to impress the practitioner with the necessity for caution in overstepping the established maximum dose, and, on the other hand, to enable the pharmacist to exert a certain control regarding the dosage of potent drugs, and both ends are automatically attained by the observance of certain regulations differing but slightly in the different countries.

In the majority of cases the medical man who wishes to prescribe a larger dose than the official maximum amount denotes that this is his intention by adding a note of admiration (!) after the amount in the prescription. This is required in Austria, Germany, Hungary, Russia, Japan, Holland, and Switzerland; in Belgium either a note of admiration may be used, or the amount must be underlined; Hungary, as an extra precaution, demands that the amount shall be written out in full as well as the addition of a note of admiration; while Italy does not require a note of admiration, but the amount must be written in words and not stated in numbers.

France does not possess a table of maximum doses with the same official character as have those of other countries. The last edition of the French Codex contains a list of maximum usual therapeutic doses, but it is distinctly stated that these are merely informatory and not binding on the prescriber. However, in overstepping these, to denote that such is his intention, the medical practitioner is advised to add the words "je dis ....."

The question now arises, What is the pharmacist to do when confronted by a prescription calling for an amount of a potent drug in excess of the official maximum dose and without the note of admiration or the amount not written out? This eventuality is provided for in the medical laws of most countries, which in this point exhibit a striking uniformity. For this reason the German regulations may be adduced in

illustration, as they practically apply equally to other countries having the same safeguards.

If the pharmacist finds that the amount of a potent drug to be taken by the patient is in excess of the maximum dose and the medical attendant has omitted to add a note of admiration after the amount, or if he has reason to assume that the prescription contains an error, he is required to draw the prescriber's attention to the omission or supposed error; if he cannot do so orally he must communicate with the prescriber by means of a closed letter. If the medical practitioner insists upon the prescription being dispensed as written the pharmacist may do so under the practitioner's responsibility, but he must at the same time inform in writing the district medical officer of the facts, or if the latter is the prescriber of the debatable prescription he must report the matter to the provincial government, who submits it to the medical council.

In the case of a prescription calling for an amount of a potent drug in excess of the maximum drug, where the pharmacist cannot communicate with the prescriber, the former must reduce the amount to that of the maximum dose (in some German States to half the maximum dose), for adults in the table must be decreased for children in the following proportions:—

For children up to 1 year	1/20 to 1/10
,, ,, of 2 to 3 years	1/8
,, ,, ,, 4 ,, 5 ,, ...	1/6
,, ,, ,, 6 ,, 8 ,, ...	1/4
,, ,, ,, 9 ,, 11 ,, ...	1/3
,, ,, ,, 12 ,, 15 ,, ...	1/2
,, persons ,, 16 ,, 19 ,, ...	3/4

Over 20 years of age the full maximum doses are applicable.

Russia even includes maximum doses for the bromide and iodide of potassium and sodium, viz.:—

	Single dose.	Daily dose.
Potassium bromide	60 grs.	150 grs.
Sodium bromide	60 ,, ...	225 ,,
Potassium or sodium iodide ...	15 ,, ...	90 ,,

The Dutch Pharmacopœia fixes the maximum dose for subcutaneous injection of atropine sulphate at 1/125th grain, of morphine hydrochloride at 1/3rd for a single and 1 grain total daily dose, of strychnine nitrate at 1/32nd and 1/6th grain respectively. In Switzerland the maximum doses

Some Official Maximum Doses of Foreign Pharmacopœias (Amounts in Grains or Minims).

(B.P. doses given in brackets.)	Austria.		Belgium.		Denmark.		France.		Germany.		Holland.		Hungary.		Italy.		Japan.		Russia.		Switzerland.	
	S.	D.	S.	D.	S.	D.	S.	D.	S.	D.	S.	D.	S.	D.	S.	D.	S.	D.	S.	D.	S.	D.
Acetanilid (1 to 3 grs.)	7½	30	—	—	7½	30	5	24	7½	24	7½	30	7½	24	—	—	7½	24	7½	30	7½	24
Acid. arsenios. (1/60 to 1/15 gr.)...	1/12	½	1/12	½	1/12	½	1/12	½	1/12	½	1/12	½	1/12	½	1/12	½	1/12	½	1/20	½	1/12	½
Atropin. sulph. (1/200 to 1/100 gr.)	1/64	1/20	1/64	1/32	1/64	1/32	1/64	1/32	1/64	1/20	1/64	1/20	1/64	1/20	1/64	1/20	1/64	1/20	1/64	1/20	1/64	1/20
Cocain. hydrochl. (1/20 to ½ gr.)	⅔	2½	⅔	2½	⅔	2½	⅔	2½	⅔	2½	⅔	2½	½	2½	⅔	2½	⅔	2½	½	2	½	1
Codein. phosph. (¼ to 2 grs.)	—	—	1½	5	1½	5	1½	5	1½	5	—	—	—	—	—	—	—	—	1½	5	1½	5
Extr. belladonn. (¼ to 1 gr.)	⅔	3	⅔	1½	⅔	3	½	1½	⅔	2½	½	1¼	½	1½	⅔	2½	—	—	½	3	⅔	2½
Fol. digital. (¼ to 2 grs.)	3	9	3	9	3	15	3	15	3	15	2½	7½	3	15	3	15	3	15	1½	12	3	15
Hexamethylenetetramine	—	—	—	—	—	—	—	—	15	45	—	—	—	—	—	—	—	—	—	—	—	—
Morphin. hydrochl. (¼ to ½ gr.)...	½	1½	½	1½	½	1½	½	1¼	½	1½	½	1½	½	1½	½	1½	½	1½	½	1½	½	1½
Opium (½ to 2 grs.)...	2½	7½	2½	7½	2½	9	3	9	2½	7½	1½	6	2½	7½	1½	7½	2½	7½	2½	7½	2½	7½
Phenacetin (5 to 10 grs.)	15	45	—	—	15	60	15	45	15	45	7½	30	15	45	7½	45	15	45	15	60	15	45
Santonin (2 to 5 grs.)	1½	5	1½	5	1½	5	1½	5	1½	5	1½	5	1½	5	1½	5	1½	5	1½	6	1½	5
Strychnin. nitr.	⅛	⅛	1/12	⅛	1/12	⅛	—	—	1/12	⅛	1/12	⅛	⅛	⅛	1/12	¼	1/12	¼	1/20	⅛	⅛	⅛
Theobromin-sodium salicyl.	15	90	15	45	—	—	—	—	15	90	15	75	15	120	15	90	—	—	15	90	15	90
Tinct. opii (20 to 30 min.)	25	90	25	90	25	100	34	100	25	90	17	70	25	90	25	90	25	90	10	40	25	90
*Tinct. strophanth. (5 to 15 min.)	8	30	8	25	4	15	3	10	8	25	8	35	8	35	8	35	8	25	8	25	8	25

* The B.P. preparation is only 1:40, that of other pharmacopœias is 1 in 10. S. and D. = Single and Daily.

informing the medical practitioner in writing of the fact. The Hessian medical law distinctly states that all such communications passing between pharmacist and medical practitioner must be made in such a way as not to come to the knowledge of third persons; further, the pharmacist is not entitled to criticise a doctor's method of prescribing.

When confronted by an unusually high dose of a potent drug, or by a mistake in a prescription, the Italian pharmacist is required to demand the authorisation in writing from the medical man to dispense the medicine, and the purpose for which it is intended must also be stated.

Maximum Doses.

The maximum single and daily doses of a few potent drugs in a number of pharmacopœias are reproduced in the accompanying table. These doses refer to internal administration, but in Germany, Holland, and Switzerland they also apply to medicines administered in the form of hypodermic injections, enemata, and suppositories; in Germany they even apply to eye lotions and inhalations, and in Holland also to injections into the urogenital apparatus.

Special reference to decreasing the maximum dose for children is made in the Belgian pharmacopœia, while the Russian pharmacopœia states that the maximum doses given also apply to external application in the case of creosote, creosote carbonate, guaiacol, and methyl salicylate.

The Need for Safeguards in Great Britain.

From the above it is clear that the provision of a safeguard for prescriber and dispenser in the shape of an official table of maximum doses, with fixed rules regulating its application in practice, although perhaps irksome at times, has obvious advantages for both parties. Now that prescribing has become considerably more general in Great Britain, the necessity for a similar measure is more apparent. The forthcoming publication of a new edition of the British Pharmacopœia seems to offer an opportunity to incorporate in the volume a table of maximum doses suitable to British conditions, while the General Medical Council and Pharmaceutical Society might jointly elaborate a set of rules to be observed in special circumstances.

ROYAL FREE HOSPITAL.—Princess Christian of Schleswig-Holstein, president of the Royal Free Hospital, laid the foundation-stone of the Helena Building, an additional wing of the hospital, on May 19th. Purses containing the sum of £1762 were received for the building fund.

BRISTOL AND WESTERN COUNTIES.

(FROM OUR OWN CORRESPONDENTS.)

University of Bristol: the Proposed Inquiry.

THE University Council, at a meeting on May 8th, heard the complaint of Dr. Gerothwohl, the lecturer who has been alleging various grievances against the University and demanding an inquiry. The resolution of Senate relieving Dr. Gerothwohl of his duties as lecturer was confirmed by Council, who also passed a resolution stating that an inquiry would be welcomed if it were called for by the proper authority. The Vice-Chancellor has also pointed out that Dr. Gerothwohl can address his complaint to the University Visitor, who can call for an inquiry if he thinks fit. Further, a reply to the various charges made against the administration of the University has been addressed by the Vice-Chancellor to the members of the University Court. He pointed out in this document, first, that the constitution of the University presents no special or unusual features. The Council, which has rather unkindly been described as a non-academic body, contains a substantial majority of university graduates, many of them scholars of distinction. Next, it is incorrect to say that Council habitually overrides the decisions of Senate. Again, professorial chairs are secure of tenure under conditions established at the time when the University received its charter in 1910. The Vice-Chancellor disposes of the charges in respect of wrongful dismissal of lecturers, and points out that Senate itself has denied the allegations of friction with the Council and also of insecurity of tenure of academic appointments. The case of Professor Cowl, which has figured largely in the charges against the University administration, is dealt with at length, and it is shown, first, that he was not "dismissed," as has been alleged, but that he was not elected to the chair he had held in University College, Bristol, when that college became merged in the new University; that this non-election was an exercise of the Council's legal powers; and finally, that the step was made as easy as possible for Professor Cowl by the conferment of a two years' research professorship which carried a salary but no duties with it, and which was accepted by Professor Cowl. Last of all, the much-discussed honorary degree list is considered in detail, and the case for it stated with considerable force. Whether the inquiry be held or not, it must be acknowledged that the Vice-Chancellor's detailed and candid reply to the charges which have been brought against the University will be welcome to all those who hope great things from its future.

Bristol General Hospital Surgical Staff.

Mr. H. G. Kyle, having resigned from the honorary surgical staff of the Bristol General Hospital, has been appointed consulting surgeon. Mr. E. W. Hey Groves has been promoted to a full surgeonship, after filling the post of assistant surgeon for ten years with distinction. The new assistant surgeon is Mr. C. A. Moore, who is a Bristol student, and holds various appointments, being also senior resident officer at the General Hospital.

Bristol Open-air School.

The school which it is proposed to open in Bristol for feeble and tuberculous children is causing a great outcry among the inhabitants of Knowle, a healthy southern suburb where the school will stand. The fear is that the value of property will be depreciated by the risks of tuberculosis infection which the foundation of the school will introduce. To those who know how excessively rare open pulmonary tuberculosis is in school children these fears are somewhat ludicrous; but it must be acknowledged that the exaggerated statements in regard to the prevalence of tuberculosis in childhood which have emanated from a section of the profession must be held partly responsible for the panic.

Lord Mayor of Bristol's Hospital Sunday Fund.

The fund collected in 1913 amounted to a larger sum than that of the preceding year, the total being £1943 9s., as against £1894 14s. The four large charities (Royal Infirmary, General Hospital, Children's Hospital, and Eye Hospital) receive a total of £1800, while £82 goes to smaller institutions. This increase is the more gratifying, as it coincides with the introduction of the National Insurance Act, which was confidently expected to cause a falling off.

Health of Cheltenham in 1912.

The medical officer of health for Cheltenham, Dr. J. H. Garrett, in his annual report for 1912 states that the death-rate was 13·2 per 1000 compared with 13·7 for the preceding ten years' average. The birth-rate, 15·8 per 1000, was the lowest on record, the average birth-rate for the previous ten years being 19. The infant death-rate was also the lowest on record—viz., 66 per 1000—the average for the past ten years being 106.

Royal Sanitary Institute at Cheltenham.

A sessional meeting of the Royal Sanitary Institute was held at Cheltenham on May 16th, under the presidency of Dr. Louis C. Parkes. The subject for consideration was the Aids and Hindrances to the Present-day Efforts to Diminish Tuberculosis. Dr. J. H. Garrett opened the discussion, and Dr. J. Middleton Martin, medical officer of health for Gloucestershire, was amongst the speakers. In the discussion emphasis was laid on better housing, proper feeding and regularity of life as preventative means. Sanatorium treatment was generally approved, but not as a complete requirement.

Death from Overdose of Sulphate of Magnesium.

An inquest was held at Weymouth relative to the death of a young nurse employed by a naval officer. Evidence showed that the deceased girl collapsed after taking sulphate of magnesium. After evidence had been given by the analyst and the medical man who had performed the necropsy, a verdict of "Death due to misadventure by an overdose of Epsom salts" was returned.

The late Lieutenant-Colonel Alexander William Mackenzie, I.M.S. (retired).

Lieutenant-Colonel A. W. Mackenzie, Indian Medical Staff (retired), died suddenly from syncope recently, at Plymouth, where he was on a visit. Colonel Mackenzie, who was in his 60th year, graduated M.B., C.M. Aberd. in 1876, and the following year joined the Indian Medical Service as surgeon. He was promoted surgeon-major in 1889, and in 1897 retired with the rank of lieutenant-colonel. He saw a considerable amount of active service. He was in the Afghan war of 1878 to 1880, being at the engagement of Charasiab, and accompanied Earl Roberts in the march to Kandahar. He was also with the expedition to the Atchakzai country, and received the medal, clasp, and bronze decoration. Colonel Mackenzie also served with the Mahsood Wuzweeree expedition in 1881, and with the two Miranzai expeditions in 1891, and received the medal with clasp. For the past 10 years he had resided at Paignton, where he was much respected, and great sympathy is felt there for the family.

The late Mr. Henry Brook, M.R.C.S. Eng.

Mr. Henry Brook died recently at his residence, Moulton House, Weston-super-Mare. Mr. Brook received his medical education at University College Hospital, taking the M.R.C.S. qualification in 1855 and the L.S.A. two years later. He served as assistant surgeon during the Crimean war, and was formerly on the honorary staff of the Bridgwater Hospital. Mr. Brook, who had retired from active work, had resided for some years at Weston-super-Mare. He leaves a widow but no family.

May 20th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

British Medical Association Meeting, 1914.

AT a meeting of the Aberdeen University Court held on May 13th a deputation from the Aberdeen Branch of the British Medical Association was received with regard to Marischal College buildings being placed at the disposal of the Association for its meetings in July of next year. This will be the first time the meetings have been held in Aberdeen, and Principal G. A. Smith, on behalf of the court, promised a very sympathetic consideration of the appeal.

Aberdeen County Insurance Committee.

At a meeting of the Provisional Insurance Committee for the county of Aberdeen on May 17th it was stated that there were 116 doctors on the panel. All applications to make their own arrangements for medical attendance had

been examined on their own merits, and no sufficient reason had been advanced in any case. Arrangements for medical benefit for temporary residence in the county had been made. From now until September there is a considerable inflow of fishworkers. The employers of people coming into the county are expected to make a return of those so coming in, mentioning the county from which they came. The clerk would then transmit the names to those counties from which insured persons had been transferred, and a contribution would be required from those counties to the Aberdeenshire Medical Fund, so that the doctors might receive their fees on the recognised scale for medical attendance on those people during their stay. The doctors appear satisfied with the arrangement. An application from the medical superintendent of Kingseat Asylum for the approval of that institution as a system under the Act was refused, and the employees at Kingseat Asylum must therefore select their doctors from the panel.

Bad Housing for Farm Labourers in Caithness.

At a meeting of the Caithness county council held at Wick on May 17th there was a discussion about the economic conditions of the rural workers in the county, and it was stated that many of the farm servants were to-day living in houses that had been condemned by the first medical officer of health for the county, yet for which nothing in the way of improvement had since been done.

Phthisis in Caithness.

At a meeting of the Caithness county council held on May 10th it was reported that the joint committee representing Sutherland and Caithness had agreed to the erection of a sanatorium of corrugated iron to accommodate 20 beds, 12 for Caithness and 8 for Sutherland, the cost to be borne by both counties in proportion to the number of beds. It was agreed to suspend action until the Local Government Board should signify its approval of the scheme. Dr. G. Dick, county medical officer of health, stated that since the Act came into operation they had had as many cases notified as during the whole of the three previous years since notification was started. It seemed, therefore, as if the present scheme before the council would be totally inadequate. It was agreed to support the County Councils' Association in asking that the whole cost of sanatorium treatment to the insured should be borne by the County Insurance Committees, with the aid of a Government grant if necessary. The chairman of the County Insurance Committee, while supporting this proposal, pointed out that up to the present the committee had spent all the money available for tuberculosis, and if another patient came in next week they would have to go to the local authority and confess that their funds were exhausted. There seemed good ground for saying that the Government had entered into a contract with insured persons to provide sanatorium treatment, and the Government should fulfil its pledge.

May 20th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Certificates under the National Insurance Act.

THE Insurance Commissioners have taken an unusual step in advertising for medical men for the city of Limerick whose duty it will be to sign certificates under the Insurance Act. It is proposed to appoint a number of medical men at salaries of £130 a year, the gentlemen appointed to be permitted to engage in private practice. Each insured person requiring a certificate for any purpose under the Act will be entitled to obtain it free of charge from these gentlemen. The profession in Limerick is well organised, and some weeks ago unanimously decided to refuse the offer made by the Commissioners in regard to payment for certificates. Since then the Commissioners have threatened to appoint salaried officers for the purpose of signing certificates, and this threat they are now attempting to carry into effect. The provision that such officers may engage in practice is intended to frighten the members of the profession by the fear that their practices may be undermined. An important ethical question will arise should the Commissioners succeed in getting medical men to accept appointment. Is a medical man justified in examining a patient who is at the time under the care of another medical man? It is hardly likely that such conduct would bring a practitioner under the ban of the General Medical Council, but it might easily expose him to the censure of his college, on the ground that he was endeavouring to obtain practice by unworthy means. If the Commissioners succeed in crushing the profession in Limerick, the same policy will doubtless be tried elsewhere.

Peamount Sanatorium.

A difficult situation has been created by the Local Government Board in connexion with the election of a medical superintendent for Peamount Sanatorium. Dr. J. J. McGrath was elected recently, subject to the sanction of the Local Government Board. On the day following the election a letter was received from the Local Government Board expressing surprise at the election of Dr. McGrath, on the ground that he had no experience in the management of a sanatorium, and threatening that it might have to consider the question of withdrawing its sanction to the admission of any further insured patients to Peamount unless a superintendent having what they considered to be adequate experience was appointed. A further meeting of the committee was accordingly held on May 15th, when it was resolved to advertise again for a superintendent. Dr. McGrath's application was based on the qualifications prescribed by the Local Government Board's Order of July 19th, 1912, he having obtained a certificate from the Alan Ryan Hospital and Collier Memorial Dispensary, both institutions recognised by the Local Government Board for obtaining the special experience indicated in its Order.

Water-supply of Warrenpoint.

On May 12th their Excellencies the Lord Lieutenant of Ireland and the Countess of Aberdeen opened the new water-supply provided by the urban council at Warrenpoint. The new scheme intercepts two rivers in the Mourne mountains, with a catchment area of 2694 acres, 500 feet above sea level, and the water is conveyed to a circular reservoir (which when full will hold 300,000 gallons) a mile from Warrenpoint and at an elevation of 270 feet above the sea, 90 feet higher than the highest point in Warrenpoint. The cost of this new scheme has been £8890.

The Treatment of Consumption in Belfast.

At a meeting of the Belfast city council in committee on May 13th the tuberculosis scheme proposed by the public health committee was considered. An estimate of the cost of the provision of treatment amounts to £36,158. The Local Government Board have advised the Belfast corporation that of the £145,000 given to Ireland for grants in aid of sanatoriums and the treatment of tuberculosis Belfast will receive not less than £10,000. To the estimated expense of £36,158 (for 6000 tuberculous people in Belfast, of whom 5000 will require dispensary and domiciliary treatment and 1000 institutional treatment) must be added £3500 for the domiciliary treatment of 140,000 insured persons at 6*d.* each, and £2000 for uninsured persons, making the total yearly expenditure £41,658. Deducting £8116 13*s.* 4*d.*—grant in respect of 140,000 insured persons at 1*s.* 2*d.*—a sum of £33,491 6*s.* 8*d.* remains, of which half is to be borne by the Exchequer, consequently the total estimated cost of the scheme to the county borough of Belfast is £16,745 13*s.* 4*d.* The scheme was passed, an amendment to postpone it being lost by 19 against 9.

The National Insurance Act in Londonderry.

A deadlock has arisen in Londonderry between the doctors and the Federated Friendly Societies over the National Insurance Act. The medical men established a public medical service, open to all insured persons, with free choice of doctor. In this public medical service the scale (including drugs) originally was 1*d.* a week for workers under 16 years of age, 2*d.* a week for insured persons, with 1*d.* additional for wives, and a further 1*d.* to cover all members of a family under 16 who are not working. The employers of labour in Londonderry approached the doctors, suggesting the following terms for employees of factories and workshops: ½*d.* per week for each 5*s.* earned, with a limit of 2*d.*, the contributions to be collected by the employers and paid over to the medical service, free choice of doctor being retained. These terms were accepted by the doctors, but the Friendly Societies

prevented their adoption by the employees, offering instead 1*d.* a week including drugs. This the medical men absolutely refused. The Friendly Societies then imported three whole-time medical men from England. The struggle between the Friendly Societies and the doctors is being watched with keen interest by the public. It is simply the German experience over again in reference to national insurance.

Belfast and District Branch of the Royal Medical Benevolent Fund.

At the annual meeting held in the Belfast Medical Institute on May 16th it was reported that this year's collection was only 2*s.* 2*d.* more than that of last year. Practitioners in and around Belfast were appealed to to support the charity, and the chairman, Sir Otto Jaffé, J.P., called on the lay public of Belfast and the counties of Antrim and Down to consider what they owed to the medical profession, and to subscribe liberally to the fund. The total amount given during the year from Belfast and district was £151 19*s.* 2*d.*

May 20th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

First National Congress on the Protection of Infancy.

THIS congress was held at Bordeaux from May 9th to 11th, under the presidency of Senator M. Strauss. M. Morel, Under Secretary of State for the Ministry of the Interior, presided at the opening session. After speeches by Dr. Rousseau St. Philippe, chairman of the committee of organisation, and Dr. Rivière, general secretary of the congress, Senator Strauss referred to the fact that the Gironde, in which Bordeaux is situated, had always been a centre of philanthropic endeavour. M. Paul Morel discussed the problem of depopulation. M. Moussous and M. Leuret contributed a communication on Weaning, its Technique, Abnormalities, and Accidents, which was discussed by M. Bezy, M. Phélippot, M. Lesage, M. Rousseau St. Philippe, M. Raimondi, M. Bonnaire, and M. Schreiber. Mme. Veil-Picard and M. Sergent dealt with the *loi Roussel* and the improvements required in the regulation of the upbringing of children. M. Paterne spoke on Medical Control of Child Life, the discussion being continued by M. Viret, M. Turquan, M. Dupont, M. Ambroise Rendu, M. Bouchacourt, M. Gallard, and M. Monod. The care of infants whose mothers are factory workers was considered by M. Felhoen and M. Mercier, and M. Decherf, M. Lassabatie, M. Raimondi, M. Viret, M. Phélippot, M. Soulé, and M. Rivière took part in the discussion. M. Strauss summoned for the same evening a conference on Puericulture in France. A series of resolutions was adopted by the conference. Between the sessions the members visited the various puericultural institutions. The congress closed with a banquet and an excursion to the celebrated prehistoric caves of Eyzies.

Respiratory Gymnastics and Spinal Curvatures.

At the Société de l'Internat des Hôpitaux M. Coudray recently stated that respiratory gymnastics constituted an excellent preventive measure against spinal curvature, besides being a powerful aid to general health. They must be regarded as the preliminary to all other exercises, and should be compulsory in school gymnastics. In the treatment of curvatures they formed an aid of the first importance. The method of choice in the education of respiration, he said, appeared to be a slow movement by Silvester's method. The subjects should lie on their backs, which did not prevent the utilisation of other measures during the various orthopædic exercises.

The Hygiene of Sleep

Although about a third of life is devoted to sleep, but little pains are usually taken to invest sleep with the most favourable and hygienic conditions for repose of body and mind. In a very interesting study on sleep, Dr. Laignel-Lavastine precisely indicates what he considers its most hygienic conditions. The house should not be in a noisy quarter, the room neither too warm nor too light; the bed, which should be sufficiently wide, should be placed north and south, so that the magnetic current may traverse it lengthwise; the mattress should be hard for the young, but a trifle softer for the aged, and the feet should be warm. The sleeper should lie on the right side, to avoid gastric embarrassment. Sleep should be wooed by light reading.

Compulsory Disinfection after Deaths.

M. Landouzy, Dean of the Paris Faculty of Medicine, insisted recently in a lecture, that after death sanitary and disinfectant measures should be practised always and everywhere, even in the case of the youngest infants, for tuberculosis in infancy is more frequent than was formerly supposed. It is no less important not to forego disinfection after death in the case of those who have reached their sixtieth year, as is allowed in a recently introduced Bill; for such a limitation would foster the still prevalent error of the rarity of tuberculosis in the aged. M. Landouzy proposes to amplify this Bill by requiring disinfection after all deaths, irrespective of age. Such disinfection should be practised at the dwelling, wherever it may be, of all persons who die in hospitals, asylums, health resorts, sanatoriums, or winter resorts.

The Treatment of Sleeping Sickness.

Before the Société Médicale des Hôpitaux, on May 9th, M. Tanon and M. Dupont reported the results of their experiments on the treatment of sleeping sickness by the new arsenical derivatives of Mouneyrat, "1116" and "1151." Their study consisted of a clinical and an experimental part. In sleeping sickness the disappearance of the trypanosoma gambiense occurs in three hours in both men and animals after a dose of from 1 milligramme per 10 grammes of body weight in the mouse, and of eight milligrammes per kilo of body weight in man. The disappearance of spirilla is less rapid, but their dissolution is complete in six hours. The authors described all the phases of destruction in mice, rats, guinea-pigs, apes, and kids. From the clinical standpoint cure appears to be assured by four injections of "1116" or "1151" in a dose of from eight to ten milligrammes per kilo of body weight, provided the parasites have not invaded the nervous centres. The authors, in establishing the diagnosis of the disease, did not content themselves solely with the clinical examination, but also made an examination of the lymph gland fluids, the blood, and the spinal fluid of the patients treated by them. As evidence of cure they have relied on the disappearance of the glandular swelling, the absence of trypanosomes from the blood and glands, and on the inoculation of the red ape with blood and spinal fluid from the patient. If their observations are confirmed a cure of the disease seems possible, and trypanosomiasis, both human and animal, can be banished by the use of these drugs.

Opium and Medical Science.

Dr. Jean Abadie, one of the candidates in the *agrégation* in mental medicine, deals with the opium question. He points out the inadequacy of the legislative measures against the disastrous effects of this poison. The opium habit is extending more and more. Nowadays, in very good houses, the opium pipe has displaced afternoon tea and bridge. In military stations opium-smoking is fashionable, and the drug is spoken of as a *confiture*. Traffickers in opium at Paris have piled up a veritable fortune in the drug. Dr. Abadie has been able to obtain at a moment's notice all the equipment for opium-smoking and a certain quantity of the drug. He describes the different phases of the intoxication and the physical and intellectual degeneration of smokers, a degeneration which affects especially the will and the moral sentiments.

The Transmission of Aphthous Fever from Animals to Man.

M. Cadoit stated recently at the Academy of Medicine that prior to 1872 the contagiousness of aphthous fever to the human race had been held doubtful. At that date numerous cases of its transmission to man were put on record. It occurs most frequently through the use of raw milk from aphthous cows, but sometimes from accidental inoculation in those who tend or examine the sick beasts. Cases of human infection are relatively rare and nearly always benign; but severe, and even fatal, attacks have been observed, especially in children, as well as epidemics due to the use of virulent milk. The sterilisation of milk by boiling or prolonged heating for several minutes at a temperature of

about 100° C. is to be recommended, in the author's opinion, not only as a means of prevention against aphthous fever and other specific diseases, but as an excellent hygienic measure.

The Academy of Medicine.

M. Bazy has been elected a *membre titulaire* in the section of operative medicine by 52 out of 60 votes on the first count.

May 19th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Offer of a Reward for a Bacteriological Investigation.

A PHILANTHROPIST who does not wish his name to be disclosed has offered a sum of 10,000 marks (£500) to any investigator who may have the good fortune to discover a method by which the persons known as carriers of enteric fever bacilli may be freed from these organisms. One of the conditions to be fulfilled is that in the bowels and the urine of the "carriers" who may undergo the treatment recommended for this purpose there shall be no indication of enteric fever bacilli for a period of at least six months. Details of the methods recommended must be communicated to a committee not later than Oct. 1st, 1914. Foreigners may take part in the competition, but must have their descriptive articles written in German. The descriptions must be sufficiently clear to allow of the various processes or manipulations being repeated for the purpose of verification, and samples of the materials to be used must be sent to the committee if required. The adjudicating committee consists of Professor von Schjerning, director of the Army Medical Department and general staff-surgeon of the Army; Professor Ehrlich, of Frankfort, director of the Institute for Experimental Therapy; Professor Gaffky, director of the Institution for Infectious Diseases; Professor Kraus, director of the first medical clinic of the University of Berlin; Professor Uhlenhut, director of the Hygienic Institute at Strasburg; and Professor Hoffmann, of the Army Medical Department.

Alleged Murder by Administration of Bacterial Cultures.

Not long ago in Frankfort a man was charged with murder under extraordinary and unusual circumstances. He had been three times married, and all his wives had died from obscure causes, so that it seemed probable that he had by some means done away with them. When his residence was searched the police discovered specimens of pure cultures of the bacilli of cholera and enteric fever, cultures which were found to have come from the bacteriological institution of Professor Kraus and Professor Pribram, of Vienna. It was also ascertained that the accused had tried to purchase such cultures from bacteriological institutions in Germany, but that he was not supplied with them because he was not a medical man. He then wrote to Vienna on headed note-paper bearing the address of an alleged scientific institution, whereupon the cultures were sent to him by the Vienna institute. His correspondence showed that he had some knowledge of bacteriological matters, and a suspicious feature was that he wanted specimens from the Bulgarian war and from the quarantine station at El-Tor in Arabia, these cultures being known to be extremely virulent. Whether the death of his last wife was really due to the felonious administration of pathogenic bacteria will be investigated at his trial, which will take place shortly. The public are somewhat alarmed by the possibility of evil-disposed persons buying virulent bacteria abroad for criminal purposes. The German law does not allow such bacteria to be supplied to unauthorised individuals. It must, however, be stated that the probability of a person being murdered by the oral administration of bacterial culture is somewhat small. According to recent reports the man has admitted that he gave his wife cultures of cholera bacilli introduced into a sausage, but that no symptoms of poisoning ensued, and he thereupon complained to the Vienna Bacteriological Institution that their cultures were not virulent enough. The body of his first wife has been exhumed, and was found to contain a great quantity of arsenic.

The Moral Development of Young Persons.

An interesting inquiry into the moral development of juveniles between 12 and 17 years of age, pupils of secondary and continuation schools, was lately carried out by Dr Schäfer, a medical officer of the Berlin municipal schools. The investigation was made in the following way: the teachers were directed to ask the pupils: "Why is stealing forbidden?" and the pupils were required to give written answers, which were collected and tabulated by Dr. Schäfer. In his account of the subject he classified the answers according to the reasons which were given, dividing them into the following groups: (1) reasons having a religious basis (fear of offending God, fear of purgatory, &c.) and (2) reasons not having a religious basis. The latter included several subdivisions—namely, (1) personal reasons, such as regard for the voice of conscience, or fear of chastisement or of jail, fear of damaging their prospects in life or losing the esteem of comrades; (2) family considerations, such as the pain which would be caused to parents or the social degradation of the family; and (3) social and ethical considerations, such as unwillingness to cause injury to one's fellow creatures, or an abstract feeling of justice, or regard to the laws of the State. From the pupils of normal intelligence 1133 answers were received, and 1109 of these were used. From the feeble-minded pupils 141 answers were received, of which 47 were valueless. It was stated that at the age of 12 years religious reasons were alleged in 48·4 per cent., personal motives in 12·6 per cent., family reasons in 1·6 per cent., and social-ethical motives in 37·8 per cent., more than one reason being given by some of the respondents. At the age of 13 years the above motives were alleged in 46 per cent., 5 per cent., 1·3 per cent., and 34·2 per cent. respectively. At the age of 14 years they were alleged in 36 per cent., 20 per cent., 0 per cent., and 44 per cent. respectively. At the age of 15 years they were alleged in 16 per cent., 28 per cent., 0 per cent., and 56 per cent. respectively. At the age of 16 years they were alleged in 17 per cent., 29 per cent., 0 per cent., and 53·2 per cent. respectively, and at the age of 17 years in 11·1 per cent., 27·1 per cent., 1·2 per cent., and 60·5 per cent. respectively. It was remarkable that family motives were never suggested by pupils at ages of 14, 15, and 16 years, and that religious motives were present in girls to a later age than in boys; among boys there was a sudden decrease under this heading after the age of 14 years, when religious instruction was no longer given in school. Whilst among girls the religious, personal, and family motives were preponderant, social motives were preponderant among boys. Dr. Schäfer came to the conclusion that a young person could not be held responsible for his action before the law previous to the age of 15 years, because the majority of children have no moral or ethical sense previous to that age, whilst the present legislation allows it at the age of 12 years. A special table was devoted to the feeble-minded; it was stated that family motives were altogether absent from the reasons given by this class. At the age of 12 years religious reasons were given in 22·2 per cent., personal reasons in 66·6 per cent., and social-ethical reasons in 11·1 per cent. At the age of 13 years the above reasons were given in 28 per cent., 64 per cent., and 8 per cent. respectively; at the age of 14 years in 36·6 per cent., 52·6 per cent., and 10·5 per cent. respectively; at the age of 15 years in 5 per cent., 75 per cent., and 20 per cent. respectively. At the ages of 16 and 17 years personal motives were alone suggested, to the exclusion of all the other motives. It must be concluded that the feeble-minded are egotistical; that during their school attendance their egotism becomes weakened by religious and social-ethical considerations, but that after they have left school it becomes their predominating motive.

May 19th.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Suicide by Swallowing Petrol.

NOT long ago a lad of 18 years committed suicide by swallowing about a pint and a half of petrol. After taking it he held a lighted match to his open mouth, but this had no effect so far as igniting the liquid was concerned. The lad's stomach and œsophagus were, however, so severely injured that he died in three days. This is the first recorded instance in Hungary of the suicidal use of petrol, and as it has been found here that mentally unstable persons

sometimes imitate new methods of suicide the report of the case published in the newspapers laid stress on the agony consequent upon petrol poisoning in the hope of deterring misguided persons from following the example of the unfortunate lad.

Gumma of Vocal Cords.

At a meeting of Hungarian Rhino-Laryngologists held in April Professor Irsay showed a female patient, aged 32 years, who had for two years suffered from hoarseness, which had lately increased to such a degree that her breathing became difficult and she sometimes even felt as if she were choking. According to her own statement, she had never contracted syphilis and had not had any miscarriages. Dr. Irsay found that the left false and true cords were very prominent and transformed into a smooth swelling, at the central part of which a deep ulcer was to be seen. At the time of her admission to the hospital she was almost in a state of suffocation. The Wassermann reaction was positive. Dr. Irsay ordered mercurial inunctions, after which some aggravation of her condition was noticeable, inasmuch as the swelling became larger. An intravenous injection of salvarsan was then given, and the symptoms of suffocation ceased on the following day. Soon afterwards the swelling began to disappear and the ulcer to diminish in size. In four weeks the swelling became quite flattened and the ulcer was healed.

Syphilitic Diseases of the Aorta.

At a recent meeting of the Interhospital Association Dr. Hasenfeld read a paper on the Syphilitic Diseases of the Aorta. He said that during the last ten years he had observed 161 cases of aortitis, aortic insufficiency, and aneurysm. These cases occurred mostly in his hospital practice. The Wassermann reaction was tried in 151 cases, in 133 of which the result was positive, in 13 it was negative, and in the remainder it was doubtful. In the latter cases the patients, with two exceptions, acknowledged that they had contracted syphilis and that they had made a most energetic use of inunctions. The average interval between the infection with syphilis and the manifestation of the aortic disease was from 15 to 18 years, the shortest period being 3½ years and the longest 32 years. In almost all the cases the nature of the patient's occupation and over-indulgence in alcohol and tobacco had a decided etiological importance in the occurrence of the disease of the aorta. According to the clinical manifestations the diseases could be divided into four groups—namely: (1) cases in which symptoms resembling those of angina pectoris were prominent; (2) cases of aortic insufficiency; (3) aneurysms; and (4) aneurysms combined with aortic insufficiency. Complications were met with in 33 per cent. of the cases, and complications connected with other organs in 16 per cent. of the cases; the symptoms referable to the nervous system were mostly those characteristic of post-syphilitic and syphilitic diseases of the central nervous system. The prognoses were very unfavourable, inasmuch as 81 per cent. of the patients were dead by the end of the year 1912, and with regard to the survivors it could not be said that more than one or two had recovered, although some of them showed very considerable improvement owing to very energetic treatment with mercury, iodide, and salvarsan.

The Question of Vegetarianism.

Dr. Leo Liebermann, professor of public hygiene in the University of Budapest, delivered an address at the commencement of the post-graduate course in Nagyvarad. Speaking on the hygiene of the food of the general population he said that an exclusively vegetable diet was not suitable for human beings, because the proteid molecules of plants did not contain all the atoms in the proportionate quantity which was needed for the proper alimentation of the body. Persons who restricted themselves to foods of exclusively vegetable origin would therefore require to consume an excessive quantity in order to obtain the necessary molecules in adequate proportion. On the other hand, a diet consisting entirely of meat led to certain diseases. It was known that pellagra was not caused by the ingestion of maize as such, but that it arose because in the districts where pellagra occurred maize was the staple food of the people, who, in fact, hardly ate anything else. The same was the case with respect to the eating of rice. Restriction to one class of food was not wholesome for human beings, therefore the consumption of merely vegetable foods (though not detrimental) was not altogether advisable, and a diet consisting exclusively of meat was open to a similar objection. The best kind of food was a mixed diet, consisting of little meat and little fat with plenty of vegetables. In concluding his address he remarked that he used to be an ardent supporter of vegetarianism. Eminent physiologists, however, had demonstrated that the nitrogen required by the organism was not sufficiently supplied by food products of vegetable origin, the defect being not that the quantity of nitrogen was too small but that the combinations in which it was presented were unsuitable. He therefore discarded vegetarianism and now advised the use of a mixed diet.

May 19th.

UNITED STATES OF AMERICA.

(FROM OUR OWN CORRESPONDENTS.)

A Preliminary Statement on Friedmann's "Cure."

THE Board of the United States Public Health Service, which has been investigating the Friedmann "cure" for tuberculosis, at a meeting of the National Association for the Study and Prevention of Tuberculosis at Washington on May 9th, foreshadowed the probable trend of its final report. Dr. John Anderson, chairman of the Board, stated that "the effects thus far observed do not justify the confidence in the remedy which has been inspired by widespread publicity." After recounting the history of Dr. Friedmann's visit to the United States and of the Government's negotiations with him, Dr. Anderson said that Dr. Friedmann had willingly furnished a culture of the organism in the serum, but had declined to divulge its method of preparation. He had imposed as a prerequisite to the ultimate furnishing of detailed information on this point a recognition by the Board of favourable results from the use of the remedy on patients. Ninety-four patients in New York had received the first injection up to April 15th, when Dr. Friedmann was informed that the slow progress of the demonstrations compelled the board to confine its studies to these patients. In the interest of the demonstration it was suggested that the 94 patients should be seen by Dr. Friedmann with a view to giving any requisite additional injections. Up to the time of writing only five of these patients had received a second injection. Dr. Anderson further said: "We believe that at the present time we are not in a position to express an opinion based on the present condition of patients under observation. We are aware that Dr. Friedmann does not wish to be judged scientifically on newspaper statements, and he would undoubtedly disclaim responsibility for certain of those which have appeared. Nevertheless, it is on these that the public bases its opinion until replaced by reliable and unbiased scientific pronouncements supported by convincing data."

The Fourth International Congress of School Hygiene.

For the first time the International Congress of School Hygiene will meet in the United States. The congress will take place in Buffalo from August 25th to 30th, under the patronage of the President of the United States. The whole field of school hygiene will be dealt with in papers and discussions. Delegates from all the leading countries of the world and from every college and university of note in the United States, as well as from many educational, medical, and hygienic organisations, are expected. The membership fee is $5, and intending members should apply to Dr. Thomas A. Storey, at the College of the City of New York.

The Eradication of Hookworm Disease in North Carolina.

Considerable progress has been made in the campaign against hookworm disease in North Carolina. According to the quarterly report of the Hookworm Commission of the North Carolina State Board of Health, during the three months ended March 31st State and county dispensaries for the free examination and treatment of hookworm disease had been conducted in 12 counties. 34,472 persons had been examined and 10,684 persons had received free treatment.

Feeble-minded Children.

At a recent meeting of the Section of Pædatrics of the New York Academy of Medicine Dr. Charles L. Dana said that feeble-minded children were a menace to society because

of the danger of propagation, and when dependent they were also an expense to the State. The care of the feeble-minded should be under State regulation, and the State should organise a Board of Control similar to the State Board of Lunacy. Feeble-minded children should be cared for in the same way as the mentally deficient. The State Board should have a census taken and maintain a bureau of records containing the life-histories of these children. Before the children reached school age they should be cared for by their parents and afterwards by the State. Those unfit for school work should be referred to institutions. While such a plan was being worked up they would have to get on as best they could with the existing agencies. The ideal method would be to have the feeble-minded child educated, cared for, and looked after from the beginning of its life to the end, and treated merely as a person of unsound mind.

Flexner's Cerebro-spinal Meningitis Serum.

The Rockefeller Institute has announced that it will no longer prepare antimeningitis serum, and will collect no more histories of cases treated with it. According to an article by Dr. Simon Flexner in the May *Journal of Experimental Medicine*, experiments were conducted upon 1300 patients. The percentage of recoveries in gross was 70. The age of the patient was a factor in the result. Under one year recoveries amounted to no more than 50 per cent., in the second year they were 69 per cent., between two and five years 71 per cent., five to six years 85 per cent., between ten and 20 years 70 per cent., and above the age of 20 62 per cent.

Cancer Study at Harvard University.

The effect of radium in the treatment of cancer is to be made the subject of a special investigation, under the direction of Dr. William Duane, at the Harvard University Medical School. A special building is to be constructed adjoining the medical school and devoted entirely to this work, which will be under the supervision of the Cancer Commission of Harvard University.

Death of Dr. F. P. Kinnicutt.

Dr. Francis Parker Kinnicutt, of New York, professor of clinical medicine in the College of Physicians and Surgeons, Columbia University, died suddenly from apoplexy on May 2nd at a meeting of the Practitioners' Society, after reading a paper on Oral Sepsis. Dr. Kinnicutt was born in Worcester, Mass., on July 13th, 1846, and graduated in arts at Harvard University in 1868, and in medicine at the College of Physicians and Surgeons in New York in 1871. After study in Heidelberg and Vienna he returned to New York, where he became prominent and held many official and hospital appointments. In 1905 he edited, with Dr. N. B. Potter, "Sahli's Clinical Diagnosis." He was president of the Association of American Physicians 1906–07.

May 10th.

NOTES FROM SOUTH AFRICA.

(FROM OUR OWN CORRESPONDENT.)

Research Work on the Rand.

AT the annual meeting of the Witwatersrand Native Labour Association the chairman stated that the death-rate amongst the tropically recruited labourers had considerably decreased, despite their physical condition on arrival being often far from satisfactory through famine in the recruiting areas. Pneumonia was still responsible for the greatest number of deaths, but the association was doing its best, and he thought that the work already done was encouraging. He referred to the engagement of Sir Almroth Wright and the continuation of his work by Dr. R. W. Dodgson and Dr. Parry Morgan, who had left the Rand at the end of last year, and he further stated that Dr. W. Watkins-Pitchford and Mr. G. D. Maynard were examining and collating the data collected by the original investigators for examination by Sir Almroth Wright, from whom a final report might be expected about the middle of the year. If the results were encouraging it was proposed to continue the work under the auspices of the South African Institute for Medical Research now in course of erection. Mr. R. Warriner, general manager of the Crown mines, in a recent presidential address to the Association of Mine Managers, spoke most hopefully as to the outlook in regard to miners' phthisis, and stated that he believed that as the result of new improvements and of the enforcement of the regulations there would in time be little risk of this disease being contracted on the mines. The new measures which had been taken at a great cost had been so effective that dust was now hardly appreciable, even at the development faces. The difficulty in the adoption of these measures had been in the absence of a common policy among the mines. If stringent measures were enforced on a particular mine the miners migrated to another, where the management was less strict. This opinion appears to be upheld by a number of mine medical officers.

Natives in Hospitals.

Last year a conference was held in Johannesburg of representatives of the hospitals in the Transvaal on the problems raised by the employment of natives in those institutions and the engagement of white female nurses in male native wards. The conference condemned without a dissentient the employment of male natives in white female wards even for cleaning purposes only. The hospitals represented are taking steps to carry out the recommendation, and the male native cleaner is being replaced by white or coloured women. The second resolution recommended that male native patients should be nursed by male European orderlies. A few years ago such a proposal would have received scant support from the medical profession in South Africa, but there has undoubtedly been a change in opinion in professional circles in recent years, and there is now a large number of medical men, particularly in the North, who roundly declare that the employment of female Europeans in male native wards is not under any circumstances capable of justification. Even in the Cape Province, where natives have been in touch with civilisation, one now meets medical men who object to the European female nurse being employed in the native male wards, whilst the laity are almost unanimous against it. The Administrator of the Cape Province during the passage of the Hospitals Ordinance last year only succeeded in resisting an amendment designed to prevent the European female nurse being employed in such wards by himself introducing a clause requiring boards within six months to provide sufficient orderlies, wardboys, and native or coloured wardmaids or nurses, to perform all menial duties in native male wards, leaving it still open for the European female nurse to supervise and render professional assistance. In the Transvaal one hospital is endeavouring to replace white female nurses by native women especially trained for the work. In others the European orderly is being introduced at considerable additional expense.

Debate on Leprosy.

Mr. H. M. Meyler moved recently in the House of Assembly: "That the attention of the Government be drawn to the alarming increase of leprosy amongst natives living on the slopes of the Drakensberg, Natal, and that it be requested to take immediate action to cope with this evil." He referred the House to the magisterial report for 1911, the latest obtainable data. The Census figures were incorrect. According to them, there were only 146 lepers in the Province of Natal, whereas in the district of Bulwer alone the magistrate's report showed that there were 89 known cases, while twice that number were known to the district surgeons. He pointed out that these natives did not abstain from going to work, but engaged themselves as domestic or other servants where they were not known. The spread of the disease had occurred during the last three years since union, and he urged the enforcement of segregation. Dr. J. Hewat moved as an amendment that the Government be requested to consider the advisability of appointing a commission without delay to inquire into, and report upon, the present methods of segregating lepers in the Union of South Africa. Although in 1911 and 1912 the Union Parliament resolved on a commission on leprosy, no such commission had been appointed. He advocated again the appointment of an expert commission because two questions must be settled before they incurred further large expenditure: whether the method of segregation was correct; and, if so, whether the asylums, especially Robben Island, were up to date. He quoted the opinions of leading authorities showing what divergent views regarding leprosy contagion existed, and said that South Africa afforded

a better field for investigating and placing upon a scientific basis the whole subject than any other country in the world. Robben Island had been used as a leper asylum for nearly a hundred years, and yet they had not had a single case of contagion that would bear investigation. If segregation were necessary it must be carried out completely, and the asylums made places of which the country might be proud. If a commission were appointed the lepers themselves would cease agitating and the Government would be justified in adopting a fixed policy at any cost. The Hon. A. Fischer, Minister of the Interior, after expressing his sympathy, thought that they should do something at once on the strength of the information the Government had furnished in past reports. They proposed to enforce segregation as far as practicable throughout the Union, and by asking the House to sanction the removal of all the lunatics from Robben Island, to make the buildings suitable, and to improve the water-supply. He intended to deal with the question in Natal also. He regretted he could not see his way clear to appoint a commission, because in his opinion it would not be in the interests of the lepers and would delay immediate action. Other speakers sharply criticised the Government for not agreeing to the proposal for a commission.

April 17th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Village Sanitation in Bengal.

THE lack of proper organisation and guidance is more responsible for the present state of village sanitation in Bengal than want of funds. In many villages considerable sums are spent annually in what is called *Barwari Puja*, the whole or the major portion of which might with advantage be spent in improving sanitation. If the leaders of public opinion were to turn their attention to this subject with half the zeal devoted to the *Swadeshi* (or Home Rule) agitation, much could soon be accomplished. If the district boards performed their legitimate duty of improving means of communication, encouraged instruction of the people in the principles of sanitation, and if the Government would aid the forward movement by legislation against polluting water, &c., the present disgraceful state of rural sanitation in Bengal would soon improve.

Calcutta Tower of Silence.

About three years ago a project was set on foot by the Parsi community in Calcutta to erect a new Tower of Silence in place of the old one which was built about 85 years ago. When the Calcutta corporation was approached for a grant of a free plot of ground some opposition was raised, but the commissioners ultimately met the claims of the community, as the medical officer of health advised them that there was no evidence to show that there were hygienic objections to the Parsi method of disposing of the dead. After strenuous labour extending over three years the tower is now complete, and its consecration ceremony took place recently.

Calcutta Housing Problem.

In spite of the transfer of the capital and the large number of residential quarters and flats that have recently been erected in Calcutta, the housing problem is as sore a question as it has ever been, and there is no indication of a decline in rents. Moreover, there seems no immediate prospect of the congested parts of the city being relieved.

The Order of St. John in India.

His Majesty the King has sanctioned the appointment of Dr. A. S. Allan, of Calcutta, as an Honorary Associate of the Order, and the Grand Prior and Chapter General have awarded the Vellum Vote of Thanks to Dr. W. Willoughby Kennedy, of Calcutta, and Dr. Birendra Kesari Banerji, of Dacca.

The Health of Bombay.

Some noteworthy features characterise the health report for Bombay for the last quarter. There was a marked reduction in general mortality, which was the lowest recorded in the first quarter of any year since the advent of the plague in 1896. Mortality from pulmonary tuberculosis was also less than in any quarter since 1896. There was also a notable reduction in deaths from fever and plague, together with an encouraging reduction in infant mortality and in every principal cause of death. On the other hand, births were 36 less than the mean. The medical officer is unable to account for this sudden diminution, but says it is probably due to the difficulty of finding suitable accommodation for families owing to the displacement of population by the demolition schemes for the improvement of the city. There may have been temporary emigration of family population to their native homes in the country around.

Hospital Stoppages of Nursing Orderlies.

The Government of India has decided to authorise the remission of half hospital stoppages in the case of British soldiers who contract enteric fever whilst employed as nursing orderlies on enteric fever patients in hospitals.

Indian View of Insanity.

The Indian public seems to be learning what is the proper function of a lunatic asylum. For example, the three asylums in the United Provinces received last year 406 patients, as against 308 in the previous year. The superintendent at Agra reports that the increase in that institution "can in no way be taken as due to an increase in the prevalence of insanity in the province, but to the Indian gradually getting rid of the idea that an asylum is merely a place of confinement, a type of jail, and becoming inculcated with the knowledge that it is a hospital for the cure of illness. The recovery rate has gone far to spread this among the Indian population, and the very much larger number of acute cases admitted, and the marked increase in the number of paying Indian patients support this assertion."

Infantile Mortality.

Surgeon-General Sir C. Pardey Lukis, K.C.S.I., Director-General, Indian Medical Service, and Major Hutchinson, I.M.S., will represent the Indian Medical Service at the approaching conference on Infantile Mortality.

Cholera in Indian Collieries.

There is a serious outbreak of cholera in the Jherria coal-fields. The epidemic is being dealt with in a capable manner by the Indian Mining Association, and the probability is that the disease will soon be eradicated. Unfortunately, in spite of all the measures which were at first adopted, the disease made considerable headway, and its virulence has practically shut down one of the collieries.

April 25th.

Obituary.

SIR JOHN W. TYLER, KT., C.I.E., M.D. ST. AND., F.R.C.S. EDIN.

WE regret to record the death on May 13th, at the age of 74, of Sir John William Tyler, late Inspector-General of Prisons, North-West Provinces and Oudh. John Tyler was born in India in 1839, and was educated at Doveton College and at the Medical School, Calcutta. He qualified by taking the L.S.A. in England in 1861, and the following year obtained the L.R.C.P. & S. Edin., and received the M.D. degree of St. Andrews University. He joined the public service as civil surgeon at Etah in 1866, and four years later was admitted as a Fellow of the Royal College of Surgeons, Edinburgh. In 1886 he received the C.I.E., and was specially employed at the Colonial and Indian Exhibition, where he received the thanks of the late Queen Victoria and the then Prince of Wales for his untiring energy and the efficient way in which from the material he brought over he had organised the various Indian sections. In 1887 he accompanied the Maharajah of Bhurtpore to attend Queen Victoria's Jubilee, and in 1889 received the honour of knighthood for his services. He was appointed Inspector-General for the United Provinces in 1890, holding that position until he retired in 1896. Sir John was a man of good physique and courtly manner. Although a firm disciplinarian he was kindness itself to those about him, and hospitable to a degree. Nothing pleased him more than entertaining his friends, and those who in his later days had the pleasure of knowing him were always charmed to be in his society and to hear him recount his various experiences during his long residence in India. The medical profession

has lost in him another of those of the past generation who are not easily replaced.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Willy Thorn, senior obstetric physician of the Sudenburg Municipal Hospital, Magdeburg, from pyæmia contracted from a patient. His age was 55.—Dr. P. A. Teschemayer, medical councillor of Neuenahr.—Dr. Wilhelm Müller, of Munich, senior staff-surgeon in the Bavarian army.—Dr. Théophile Anger, formerly surgeon to the Paris hospitals.

Medical News.

FOREIGN UNIVERSITY INTELLIGENCE.—*Bahia:* Dr. John Miller, *privat-docent* of pathological anatomy in the University of Tübingen, has been appointed to undertake the organisation of the pathological instruction.—*Berlin:* Dr. Rumpel, who has been in charge of the urological department of the Ziegelstrasse Surgical Policlinic, has been appointed to the charge of a department of the Charité, in succession to Dr. Köhler, who has retired. His former post in the Ziegelstrasse will be filled by Dr. E. Joseph. Dr. Fleischman, *privat-docent* of medicine, has been granted the title of Professor. Dr. Adam has been appointed Lecturer on Massage and Gymnastics in the First Medical Clinic. Dr. Westenhoeffer has been appointed Custos of the Pathological Institute, in succession to Dr. Kaiserling. Dr. Romer, extraordinary professor of hygiene in Marburg, will act as Chief of Dr. Flicker's Department in the Hygiene Institute during the latter's absence in Brazil. Dr. Bernhard Moller, of the Infectious Diseases Institute, and Assistant to Professor Robert Koch, and Dr. A. Grotjahn, Principal of Professor Flügge's recently erected Department of Social Hygiene in the University Hygienic Institute, have been granted the title of Professor. Dr. E. Forster, *privat-docent* of Neurology, has been granted the title of Professor. Dr. Karl Thomas has been recognised as *privat-docent* of Medicine. Dr. Alfred Dührssen, the well-known gynæcologist, has been obliged to give up his classes on account of ill-health.—*Bochum (Augusta Hospital):* Dr. Max von Brunn, Extraordinary Professor of Surgery in Tübingen, has been offered the post of Chief of the Surgical Department.—*Bologna:* Dr. Carlo Colorni has been recognised as *privat-docent* of Midwifery and Gynæcology, and Dr. Alfonso Poppi as *privat-docent* of Otology and Laryngology.—*Bonn:* Dr. K. Bachem, *privat-docent* of Pharmacology, has been granted the title of Professor.—*Florence:* Dr. Ferdinando Azzurrini has been recognised as *privat-docent* of Pathological Anatomy. Dr. Giulio Crescenzi and Dr. Michelangelo Paná have been recognised as *privat-docenten* of External Pathology.—*Genoa:* Dr. Cesare Licini has been recognised as *privat-docent* of External Pathology.—*Göttingen:* Dr. Quaet-Faslem has been promoted to the Directorship of the Rasenmuhle Sanatorium for Nervous Diseases, in succession to the late Dr. Cramer.—*Jena:* Dr. v. Rohr has been appointed Extraordinary Professor of Medical Optics. Dr. J. Zange has been recognised as *privat-docent* of Otology.—*Königsberg:* Dr. Carl Kaiserling, extraordinary professor of pathological anatomy in the University of Berlin, has been offered the chair of Pathological Anatomy, in succession to Dr. Henke, who has been appointed Professor in Breslau.—*Modena:* Dr. Carlo Gazzetti has been recognised as *privat-docent* of Materia Medica and Pharmacology.—*Munich:* Dr. Fritz Lange, professor of orthopædic surgery, has been appointed Director of the Royal Institution for Crippled Children. Dr. Otten has been recognised as *privat-docent* of Medicine.—*Naples:* Dr. Francesco Franzi, Dr. Mariano Lo Re, and Dr. Giovanni Radice have been recognised as *privat-docenten* of Pædiatry.—*New York (Cornell University):* Dr. G. C. Barrows has been appointed to the chair of Gynæcology.—*New York (Columbia University College of Physicians and Surgeons):* Dr. John A. Fordyce has been appointed to the chair of Dermatology, in succession to Dr. G. T. Jackson, resigned.—*Palermo:* Dr. Giuseppe Maggiore has been recognised as *privat-docent* of Internal Pathology.—*Parma:* Dr. Ferruccio Ravenna, of Pisa, has been recognised as *privat-docent* of Internal Pathology.—*Pavia:* Dr. Arrigo Visentini has been recognised as *privat-docent* of Pathological Anatomy.—*Pisa:* Dr. Giuseppe Sorbi has been recognised as *privat-docent* of Midwifery and Gynæcology.—*Rome:* Dr. G. Marchesi and Dr. C. Ortal have been recognised as *privat-docenten* of Internal Pathology; Dr. G. Colucci as *privat-docent* of Ophthalmology; Dr. U. Torrini as *privat-docent* of Otology and Laryngology; Dr. E. Luisida as *privat-docent* of Physiotherapeutics; Dr. L. Piazza as *privat-docent* of History of Medicine; and Dr. A. Splendore, of Parma, as *privat-docent* of Bacteriology.—*Rostock:* Dr. Wolff has been recognised as *privat-docent* of Pathological Anatomy.—*Strasburg:* Dr. A. Wolff, Extraordinary Professor of Dermatology and Syphiligraphy, has been promoted to Ordinary Professor.—*Turin:* Dr. L. Lattes has been recognised as *privat-docent* of Forensic Medicine.—*Vienna:* Dr. Bruno Busson has been offered an important post in Professor Paultauf's Serotherapeutical Institute, in succession to Dr. Kraus, who goes to Buenos Aires.—*Würzburg:* Dr. Theodor Boveri, Professor of Zoology and Comparative Anatomy, who was offered the Directorate of the Berlin Institute of Biological Research, has decided to remain in Würzburg. Dr. J. Riedinger has been appointed Extraordinary Professor of Orthopædic Surgery.

POOR-LAW MEDICAL OFFICERS' ASSOCIATION OF ENGLAND AND WALES.—A council meeting of this association was held at 24, Copthall-avenue, London, E.C., on May 15th, Dr. D. B. Balding, J.P., being in the chair. The honorary secretary reported with regret the death of a member of the council, Mr. T. Carey Barlow. A letter was read from one of the district medical officers of the East Ham Union, stating that the guardians were proposing to supply, at their own cost, the medicines, &c., hitherto found by the medical officers, and that the clerk to the guardians had inquired of them as to what deduction from their salaries they were prepared to allow in consequence. The district medical officers objected to any such deduction. The council was strongly of opinion that no deduction should be permitted. The question also came before the council of the responsibility of guardians to pay for services rendered to inmates of their workhouse by practitioners called in in the absence of the workhouse medical officer. This had recently occurred in a northern town, and it was asked whether the practitioner who attended could claim a fee. The council was of opinion that if outside medical assistance were called for on behalf of the guardians by an officer entitled to pledge the credit of the same, a fee could be recovered. In all cases the workhouse medical officer should have a deputy appointed by himself, and it was not clear why in this instance the deputy had not been sent for. It was decided that the annual meeting should take place on July 3rd.

SOCIETY FOR THE RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—The annual general meeting of this society was held on May 6th, when the chair was taken by the President, Sir Thomas Boor Crosby, M.D. The report for 1912, which was presented and adopted, showed that eight new members had been elected during the past year, seven had died, and three had resigned. At the present time the membership was 302, a very small proportion considering the number of medical men who are eligible for membership. The interest from invested funds amounted to £3180 5*s.* 9*d.* and £361 3*s.* was received from subscriptions and donations. Amongst the annuitants of the charity—namely, 46 widows and 11 orphans—the sum of £3066 was distributed, each widow receiving on an average £50, besides an additional £10 as a Christmas gift, and each orphan £15 and a gift of £3 at Christmas. The grants to orphans had been increased from £15 to £25 per annum. Under the Copeland Fund special grants were made to widows and orphans already in receipt of relief but who needed assistance owing to circumstances of unusual distress. Thirty-two letters were received from widows of medical men, who, in many instances, had been left practically penniless, asking for relief, but this had to be refused, as their husbands had not been members of the society. The report concluded by pointing out the imperative duty of members of the medical profession, especially the younger members, to join the society. The acting treasurer, Dr. F. de Havilland Hall, reported that

the society would shortly benefit under the will of the late Mr. James Brickwell to the extent of over £36,000, and the meeting terminated with a vote of thanks to the president. Membership of the society is open to any registered practitioner who at the time of his election is resident within a 20 mile radius from Charing Cross. Should any member remove beyond the limits of the society he nevertheless continues to be a member. The annual subscription is 2 guineas; every member who has paid this sum for 25 years becomes a member for life. Life membership may also be obtained by the payment of one sum, varying with the age of the applicant. Further particulars and application forms may be obtained from the secretary at the offices of the society, 11, Chandos-street, Cavendish-square, London, W.

MEMORIALS TO DR. EDWARD ADRIAN WILSON.—The residents of Cheltenham have decided to erect a memorial to their fellow-townsman, Dr. E. A. Wilson, who lost his life at the South Pole. The memorial is to take the form of medallions of Dr. Wilson and Captain Scott, to be executed from designs by Lady Scott. They will be placed in the entrance hall of the Cheltenham town hall. The authorities of Cheltenham College, where Dr. Wilson was educated, have decided to erect a memorial of their own to his memory.

DEVON AND CORNWALL EAR AND THROAT HOSPITAL, PLYMOUTH.—At the twenty-sixth annual meeting of the subscribers of the Devon and Cornwall Ear and Throat Hospital held recently under the presidency of the Mayor of Plymouth, the medical report showed that during 1912 the number of patients treated was 1270, against 1145 in 1911. During the past year the new and larger institution has been opened, and consequently additional subscriptions will be required to provide for the maintenance of the hospital, and unless more financial help is forthcoming it will be necessary to draw on the reserve funds of the charity.

PRESENTATIONS TO MEDICAL MEN.—The members of the Avonmouth (Gloucestershire) branch of the St. John Ambulance Corps recently presented Mr. John Carstairs Drysdale, M.B., Ch.B. Edin., with a silver-mounted walking-stick in appreciation of his services as honorary instructor.—The members of the Great Western Railway employees' branch of the St. John Ambulance Association for Draycott, Axbridge, Winscombe, and Cheddar stations have presented Mr. Reginald Whiteside Statham, M.R.C.S. Eng., L.S.A., with a picnic tea canteen as a mark of appreciation for his services as honorary lecturer.—On the occasion of his retirement, Mr. J. K. Lennox, L.R.F.P.S. Glasg., who has been in practice in Lochee, was entertained to dinner and presented with a purse of sovereigns. Dr. J. Mackie Whyte, the chairman, in making the presentation referred to the fact that both Mr. Lennox's parents had lived to the age of 86 years, his father having gone through the Indian Mutiny and lived many years in India.—On May 13th, in the Medical Institute, Belfast, Mr. G. Elliott, M.B., B.Ch. R.U.I., was presented by his medical *confrères* with a purse of gold, on his leaving Belfast to reside in the neighbourhood of Shrewsbury, in recognition of his work in founding the Belfast Medical Guild and of his unselfish efforts to improve the position of the medical profession in Belfast.

NATIONAL ASSOCIATION FOR THE PREVENTION OF INFANT MORTALITY AND FOR THE WELFARE OF INFANCY.—An English-speaking Conference on Infant Mortality will be held at Caxton Hall, Westminster, on August 4th and 5th, under the patronage of the King and Queen. Mr. John Burns will preside, and Lady Aberdeen, Mr. Pease, Sir George Newman, and Dr. Arthur Newsholme are among the chairmen of the various sessions into which the two sections—administrative and medical—are divided. Among the questions which will be discussed will be the responsibility of central and local authorities in the matter of infant and child hygiene, the necessity for special education in infant hygiene, medical milk problems, the administrative control of the milk-supply, and ante-natal hygiene. The United States and a large number of Colonial Governments will be officially represented, and the British railways and steamship companies with services to the Colonies and to the United States have all granted special travelling facilities. The corporations of London, Liverpool, and Glasgow have contributed towards the expenses of the Conference, and many other towns are sending sums. The programme can be obtained from the secretary of the National Association for the Prevention of Infant Mortality, 4, Tavistock-square, London, W.C.

AN appeal to the public through the columns of the *Daily Express* has resulted in the sum of £10,000 being subscribed for equipping some of the London hospitals with a supply of radium.

THE Fourth International Congress for the Hygiene and Salubrity of Dwellings will be held at Antwerp from August 31st to Sept. 7th next under the presidency of Dr. Victor Desguin, President of the Royal Belgian Society for Public Medicine. The Congress will comprise four sections: (1) The Hygiene of Emigrants; (2) Colonial Hygiene; (3) Hygiene of Ports and Ships; and (4) the Development of Towns from the Hygienic Point of View. The organising committee are making preparations for receptions, visits, and excursions. Applications for membership should be sent to the treasurer of the Congress, Mr. A. Cols, Willem Tell Street 3, Antwerp.

ROYAL METEOROLOGICAL SOCIETY.—The first afternoon meeting of the present session was held at the society's rooms, 70, Victoria-street, Westminster, on May 21st, Mr. C. J. P. Cave, the President, being in the chair. Mr. E. Gold read a paper on the Determination of the Radiation of the Air from Meteorological Observations, in which the theory of the cooling of the air during the night hours was developed and applied to observations made near the earth's surface and 130 feet above it, in order to obtain an estimate of the radiating power of the atmosphere. The results obtained show that even on calm, clear nights, when the air at the higher level is warmer than that near the surface, the cooling of the air is affected by convection, and the observations available do not suffice for the determination of the correction to the value of the radiating power necessary on this account. Mr. S. C. Russell read a paper on the Results of Monthly and Hourly Cloud-form Frequencies at Epsom, 1903–10.

DONATIONS AND BEQUESTS.—The late Mr. Arthur Robinson has bequeathed £1000 to the Bristol Eye Hospital.—The Chelsea Hospital for Women has received grants of £5 5*s.* from the Worshipful Companies of Salters and Armourers and Brasiers; and a bequest of £25 from the late Miss E. C. Laurence, for some years matron of the hospital.—The Royal Dental Hospital, Leicester-square, W.C., has received a donation of £400 from the trustees of Smith's (Kensington Estate) Charity.—The trustees of the late Sir Julius Wernher have allocated £1500 to the fund for the extension of the London School of Tropical Medicine, and £1000 for the benefit of the Seaside Convalescent Hospital, Seaford, Sussex.—Under the will of the late Mr. A. H. Crowther the Rochdale Infirmary and Dispensary will receive £5000, the Queen Victoria Memorial Nurses' Home, Rochdale, £3000, and the Children's Convalescent Home, St. Anne's-on-Sea, £200.—The late Mr. Isaac Danson left £1250 to endow a bed in the General Hospital, Birmingham.—The late Mr. Robert Ratcliff has left £20,000 to the Burton-on-Trent General Infirmary.—By will the late Miss Margaret Ashley, of Dorchester, bequeathed £1000 to the Dorset County Hospital and £100 to the Weymouth Eye Infirmary.—The late Miss Mary Ellis, of Exmouth, has by will bequeathed £500 each to the Exmouth Dispensary and Exmouth District Nursing Association, £300 to the Budleigh Salterton Cottage Hospital, £200 to the Devon and Exeter Hospital, £150 to the Exeter Eye Infirmary, and £100 to the Exeter Dispensary.—The Leith docks authorities have sent a cheque for £1500 to the Leith Hospital.—By the will of the late Mr. Edward Beck the testator bequeathed, subject to a life interest, £8000 to University College Hospital, London. The Warrington Infirmary will also benefit under the same will.—As a memorial to his uncle, the late viscount, Lord Tredegar has presented to the Newport and Monmouthshire Hospital the Friars' Mansion and its grounds of 14 acres, immediately adjoining the hospital grounds, as a convalescent home.—Under the will of the late Mr. McEwan, of Edinburgh, the Royal Infirmary, Edinburgh, will receive £15,000, and the convalescent home at Corstorphine connected with the Royal Infirmary, Edinburgh, £1000.

THE LIVERPOOL NURSING ASSOCIATION: AN OFFER TO APPROVED SOCIETIES.—The movement which has for its object the promotion of a working arrangement between district nursing associations and Approved Societies, whereby a regular nursing service shall be available for insured persons in their own homes, has met with a hearty response from the Liverpool Queen Victoria District Nursing Association, which is affiliated to the Queen Victoria Jubilee Institute for Nurses. Since July last, when the sanatorium benefits under the National Insurance Act came into operation, the Liverpool Queen Victoria District Nursing Association, by arrangement with the Liverpool Insurance Committee, has been nursing tuberculous cases among insured persons and their dependents in their own homes, for which work the Insurance Committee, only a week ago, authorised the payment to the association of £100. This arrangement with the Insurance Committee has in no way interfered with the work done by the association outside the Act in respect to tuberculous or other patients. The average number of tuberculous cases regularly engaging the attention of the association has been about 130, which is by no means an alarming figure in face of the fact that the insured persons in Liverpool number 240,000. The services of the association nurses in this direction are to be continued, and will be paid for annually. Under the provisions of the Act the sum of 1*s.* 3*d.* per insured member is set aside for tuberculous cases. Of this sum 6*d.* is earmarked for domiciliary treatment by the medical attendant, and it is out of the remaining 9*d.* that the Insurance Committee is enabled to pay for the services of the district nurses. The Local Insurance Committee has extended sanatorium benefit not only to insured persons but to their dependents. The Liverpool corporation is ahead of many other municipalities, in that it provides for all cases of tuberculosis, whether the patients are insured or not. Those cases which are outside the jurisdiction of the Insurance Committee are dealt with by the health committee of the city council in one or other of the corporation tuberculosis hospitals. The movement to coöperate with the local Approved Societies, as distinct from the Insurance Committee, is quite apart from the work done in Liverpool by the district Nursing Association with reference to tuberculous cases. The honorary secretary of the association has recently drawn the attention of the Approved Societies to the importance of providing nurses not only to minister to the health and comfort of the patients, but to save the funds of the societies by checking and shortening illness, and many of the societies, including some of the larger ones, have expressed themselves favourable to the scheme.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.—At the recent election of officers of this society for the ensuing year the following recommendations of the council were adopted:—President: Dr. W. Broadbent. Vice-Presidents: Dr. E. Hobhouse and Dr. F. Hinds. Honorary treasurer: Mr. R. F. Jowers. Honorary librarian: Dr. R. J. Ryle. Honorary Secretaries: Dr. S. B. Figgis (literary) and Mr. A. J. Martineau (financial). Council: Mr. M. N. Rigby, Mr. Walter R. Wood, Dr. L. A. Parry, Mr. W. J. Rowland, Mr. A. M. Collcutt, Mr. Hugh Stott, Mr. H. H. Taylor, Mr. C. N. Chadborn, and Dr. E. Rivaz Hunt.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

CAMPBELL, J. ARGYLL, M.D., has been appointed Professor of Physiology in the University of Singapore.

DAVIS, EDWARD D., F.R.C.S. Eng., has been appointed Surgeon-Laryngologist to the Mount Vernon Hospital for Consumption and Diseases of the Chest.

FORSTER, CHARLES MICHAEL, L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Third District by the Chipping Sodbury (Gloucestershire) Board of Guardians.

GROVES, ERNEST WILLIAM HEY, M.S., M.D. Lond., F.R.C.S. Eng., has been appointed Honorary Surgeon to the Bristol General Hospital.

HUGGINS, SYDNEY P., M.D. Lond., M.R.C.S., has been appointed Medical Officer and Public Vaccinator for the Second District of the Wycombe Union.

KYLE, HENRY GREVILLE, M.D., M.Ch. Oxon., has been appointed Honorary Consulting Surgeon to the Bristol General Hospital.

MOORE, CLIFFORD ARTHUR, M.B., M.S. Lond., M.Ch. Bristol, F.R.C.S. Eng., has been appointed Honorary Assistant Surgeon to the Bristol General Hospital.

NUNAN, T. J., L.R.C.P. & S. Irel., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Clonaslee District, Queen's County.

PATRICK, N. C., M.R.C.S., L.R.C.P. Lond., has been appointed Chief Tuberculosis Officer to the County Antrim Council.

SYDENHAM, GEORGE FRANCIS, M.R.C.S., L.S.A., has been appointed Medical Officer of Health for the Southmolton (Devon) Rural District Council.

WILLATT, JAMES HAYWARD, M.D. Liverp., has been appointed Honorary Surgeon to the Liverpool Maternity Hospital.

WOOD, GUY, M.B. Durh., has been appointed Resident Medical Officer to Sutton's Hospital, Charterhouse, London.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

ABERYSTWYTH INFIRMARY AND CARDIGANSHIRE GENERAL HOSPITAL.—House Surgeon and Secretary. Salary £150 per annum, with board and washing.

ALNWICK INFIRMARY.—House Surgeon, unmarried. Salary £140 per annum, with board and apartments.

BARNSTAPLE UNION.—Medical Gentleman for the Sick Poor of the Parish of Ilfracombe. Salary £70 per annum.

BARROW-IN-FURNESS, NORTH LONSDALE HOSPITAL.—Junior Resident House Surgeon. Salary £100 per annum, with board and residence.

BETHNAL GREEN INFIRMARY AND WORKHOUSE, Cambridge Heath, E.—Assistant Medical Officer. Salary at rate of £100 per annum, with apartments, board, and washing.

BIRKENHEAD AND WIRRAL CHILDREN'S HOSPITAL, Woodchurch-road.—House Surgeon. Salary £100 per annum, with board, residence, and laundry.

BIRKENHEAD BOROUGH HOSPITAL.—Junior House Surgeon. Salary £80 per annum, with board and laundry.

BIRMINGHAM AND MIDLAND EYE HOSPITAL.—Third House Surgeon. Salary £75 per annum, with board, rooms, &c.

BIRMINGHAM, CITY OF.—Assistant Medical Officer of Health. Salary £250 per annum.

BIRMINGHAM UNION, DUDLEY-ROAD INFIRMARY.—Assistant Medical Officer. Salary £125 per annum, with apartments, rations, laundry, and attendance.

BIRMINGHAM UNIVERSITY.—Junior Demonstrator in Anatomy. Salary £150 per annum.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—Gynæcologist.

BOLTON INFIRMARY AND DISPENSARY.—Third House Surgeon. Salary £90 per annum, with apartments, board, and attendance.

BRIDGWATER HOSPITAL.—House Surgeon, unmarried, for six months. Salary at rate of £100 per annum, with board, lodging, and washing.

BRIGHTON COUNTY BOROUGH ASYLUM, Haywards Heath.—Locum Tenens Assistant Medical Officer for three months. Salary £4 4*s.* per week.

BRISTOL, COSSHAM MEMORIAL HOSPITAL, Kingswood.—House Surgeon. Salary £100 per annum, with board, lodging, and washing.

BRISTOL ROYAL INFIRMARY.—Obstetric and Ophthalmic House Surgeon for six months. Salary at rate of £75 per annum, with board, laundry, and apartments.

BROMSGROVE, WORCESTERSHIRE ASYLUM.—Second Assistant Medical Officer. Salary £225 per annum, with quarters, board, washing, and attendance.

BURNTWOOD, COUNTY MENTAL HOSPITAL, near Lichfield, Staffs.—Junior Assistant Medical Officer, unmarried. Salary £210 per annum, with apartments, board, and washing.

CAMBERWELL INFIRMARY, Brunswick-square, and GORDON-ROAD WORKHOUSE, Peckham.—Second Assistant Medical Officer. Salary £150 per annum, with apartments, board, and washing. Also Third Assistant Medical Officer for the Infirmary. Salary £140 per annum, with apartments, board, and washing.

CANCER HOSPITAL, Fulham-road, S.W.—Physiological Chemist. Salary £350 per annum.

CANTERBURY BOROUGH ASYLUM.—Assistant Medical Officer, unmarried. Salary £160 per annum, with board, lodging, washing, and attendance.

CANTERBURY, KENT AND CANTERBURY HOSPITAL.—Resident Medical Officer, unmarried. Salary £90 per annum, with board, lodging, and washing.

CHELSEA HOSPITAL FOR WOMEN.—Anæsthetist. Salary £21 per annum.

CHELTENHAM GENERAL HOSPITAL.—House Physician, unmarried. Salary £100 per annum, with board, lodging, and washing.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—Senior House Surgeon. Salary £120 per annum, with board, apartments, and laundry.

DENBIGH, DENBIGHSHIRE INFIRMARY.—House Surgeon. Salary £100 per annum, with board, residence, and washing.

DENBIGH, NORTH WALES COUNTIES ASYLUM.—Medical Superintendent. Salary £500 per annum, with unfurnished house and other emoluments.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Assistant House Surgeon, unmarried. Salary at rate of £75 per annum, with board and laundry.

DEWSBURY UNION WORKHOUSE.—Resident Assistant Medical Officer (female). Salary at rate of £100 per annum, with rations, apartments, washing, &c.

DORCHESTER, DORSET COUNTY HOSPITAL.—House Surgeon, unmarried. Salary £100 per annum, with board and residence.

DOWNPATRICK, DOWN DISTRICT LUNATIC ASYLUM.—Junior Assistant Medical Officer, unmarried. Salary £130 per annum, with apartments, board, washing, attendance, &c.

DUBLIN, ROYAL VICTORIA EYE AND EAR HOSPITAL.—Honorary Assistant Surgeon.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—Assistant House Surgeon. Salary £55 per annum, with board and washing.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Shadwell, E.—Medical Officer to Casualty Department for six months. Salary at rate of £100 per annum, with luncheon and tea. Also House Physician for six months. Salary at rate of £75 per annum, with board, residence, laundry, &c. Also House Physician and Assistant Casualty Officer for six months. Salary at rate of £75 per annum, with board, residence, laundry, &c.

ECCLES AND PATRICROFT HOSPITAL.—House Surgeon, unmarried. Salary £70 per annum, with board, washing, and lodging.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E.—House Surgeon. Salary at rate of £75 per annum, with board, residence, and washing.

EXETER, ROYAL DEVON AND EXETER HOSPITAL.—Assistant House Surgeon for six months. Salary at rate of £80 per annum, with board, apartments, and washing.

EXMINSTER, DEVON COUNTY ASYLUM.—Third and Fourth Assistant Medical Officers. Salary £200 per annum, with board, laundry, and apartments.

GILBERT AND ELLICE ISLANDS PROTECTORATE, Western Pacific.—Medical Officer. Salary £350 per annum, free passage, and free quarters.

GLASGOW MATERNITY AND WOMEN'S HOSPITAL, OBSTETRICAL DEPARTMENT.—Two Out-door House Surgeons, also Female Out-door House Surgeon at West-End Branch, for three months.

GREENWICH, DREADNOUGHT HOSPITAL.—Assistant Surgeon.

GRIMSBY AND DISTRICT HOSPITAL.—Senior House Surgeon and Junior House Surgeon. Salary £100 and £80 per annum respectively, with board, lodging, attendance, and washing.

GUY'S HOSPITAL.—Honorary Anæsthetist.

HALIFAX, ROYAL HALIFAX INFIRMARY.—Third House Surgeon, unmarried. Salary £80 per annum, with residence, board, and washing.

HEREFORD COUNTY AND CITY ASYLUM.—Assistant Medical Officer, unmarried. Salary £155 per annum, all found except stimulants.

INFECTIOUS HOSPITALS SERVICE OF THE METROPOLITAN ASYLUMS BOARD.—Junior Assistant Medical Officers, unmarried. Salary £180 per annum, with board, lodging, and washing.

ITALIAN HOSPITAL, Queen-square, W.C.—House Surgeon for six months. Salary £60 per annum, with board and residence.

KETTERING AND DISTRICT GENERAL HOSPITAL.—Resident Medical Officer, unmarried. Salary £100 per annum, with board, residence, &c.

LANCASHIRE COUNTY COUNCIL.—Tuberculosis Officers. Salary of one at £500, and two at £400 per annum.

LANCASTER, COUNTY ASYLUM.—Assistant Medical Officer. Salary £150 per annum, with board, apartments, washing, and attendance.

LINCOLN MENTAL HOSPITAL, The Lawn, Lincoln.—Assistant Medical Officer, unmarried. Salary £150 per annum, with board, &c.

LIVERPOOL, PARK HILL SANATORIUM.—Assistant Resident Medical Officer, unmarried. Salary £150 per annum, with board, washing, and lodging.

LIVERPOOL STANLEY HOSPITAL.—Honorary Physician.

LONDON HOSPITAL DENTAL SCHOOL.—Two House Surgeons.

LONDON LOCK HOSPITAL.—FEMALE HOSPITAL: House Surgeon and Assistant House Surgeon. Salary £100 and £80 per annum respectively, with board, lodging, and washing. MALE HOSPITAL: House Surgeon. Salary £100 per annum, with board, lodging, and washing.

LOUGHBOROUGH AND DISTRICT GENERAL HOSPITAL AND DISPENSARY.—Resident House Surgeon. Salary £120 per annum, with rooms, attendance, board, and washing.

MANCHESTER, ANCOATS HOSPITAL.—Assistant House Surgeon. Salary £70 per annum.

MANCHESTER ROYAL INFIRMARY.—House Physician and Junior House Surgeon, unmarried, for six months. Board and residence provided.

MANCHESTER WORKHOUSE, Crumpsall.—Junior Resident Assistant Medical Officer, unmarried. Salary £110 per annum, with rations, apartments, fire, light, washing, and attendance.

MARYLEBONE INFIRMARY, Rackham-street, Notting Hill, W.—First Assistant Medical Officer, unmarried. Salary £150 per annum, with apartments, rations, and washing.

MERSTHAM, SURREY COUNTY ASYLUM, Netherne.—Locum Tenens Medical Officer, unmarried, for three months. Salary £4 4s. per week, with apartments, board, lodging, and washing.

MILLER GENERAL HOSPITAL FOR SOUTH-EAST LONDON, Greenwich-road, S.E.—House Physician for six months. Salary at rate of £100 per annum, with board, attendance, and laundry.

NEWCASTLE-UPON-TYNE HOSPITAL FOR SICK CHILDREN.—Honorary Assistant Physician.

NEWCASTLE-UPON-TYNE, ROYAL VICTORIA INFIRMARY.—Medical Registrar.

NORTHAMPTON GENERAL HOSPITAL.—House Surgeon, unmarried. Salary £90 per annum, with apartments, board, washing, and attendance, &c.

NORWICH, NORFOLK AND NORWICH HOSPITAL.—Casualty Officer and House Surgeon, unmarried, for six months. Salary £60 per annum, with board, lodging, and washing.

NOTTINGHAM GENERAL DISPENSARY.—Assistant Resident Surgeon, unmarried. Salary £180, with apartments, attendance, light, and fuel.

PETERBOROUGH INFIRMARY.—House Surgeon, unmarried. Salary £100 per annum, with residence, board, and laundry.

POPLAR HOSPITAL FOR ACCIDENTS, Poplar, E.—Senior House Surgeon. Salary at rate of £135 per annum, with board and residence.

PORTSMOUTH, ROYAL PORTSMOUTH HOSPITAL.—House Physician for six months. Salary £75 per annum, with board, &c.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—Honorary Physician or Surgeon to the X Ray and Electrical Department. Also Clinical Assistants for six months.

QUEEN ADELAIDE'S DISPENSARY, Pollard-row, Bethnal Green, E.—Resident Medical Officer, unmarried. Salary £100 per annum, with apartments, coal, gas, and attendance.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Dental Surgeon for L.C.C. School—Dental Cases. Salary £200 per annum.

READING, ROYAL BERKSHIRE HOSPITAL.—Second House Surgeon. Salary £80 per annum, with apartments, board, and washing.

REDHILL, EARLSWOOD ASYLUM.—Junior Assistant Medical Officer, unmarried. Salary £150 per annum, with board, residence, washing, &c.

RICHMOND, SURREY, ROYAL HOSPITAL.—Assistant House Surgeon. Salary £70 per annum, with board, apartments, and washing.

ROTHERHAM HOSPITAL AND DISPENSARY.—Assistant House Surgeon Salary £100 per annum, with board, lodging, and washing.

ROYAL EAR HOSPITAL, 42 and 43, Dean-street, London, W.—Clinical Assistants.

ROYAL HOSPITAL FOR INCURABLES, Donnybrook, Dublin.—Resident Medical Officer, unmarried. Salary £120 per annum, with board and apartments.

ST. ALBANS, HERTS COUNTY ASYLUM.—Locum Tenens Assistant Medical Officer. Salary 4 guineas a week, with board, lodging, and washing.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Plaistow, E.—Assistant Resident Medical Officer, unmarried, for six months. Salary at rate of £30 per annum, with board, residence, and laundry.

SHEFFIELD, EAST END BRANCH OF THE CHILDREN'S HOSPITAL (OUT-PATIENT DEPARTMENT).—House Surgeon. Salary £75 per annum, with board and lodging.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN.—Assistant House Surgeon, unmarried. Salary £80 per annum, with board, residence, and laundry.

SHEFFIELD ROYAL HOSPITAL.—Assistant House Physician, unmarried. Salary £80 per annum, with board, lodging, and washing.

SHOREDITCH, PARISH OF ST. LEONARD, INFIRMARY, Hoxton-street, N.—Junior Assistant Medical Officer for six months. Salary at rate of £120 per annum, with apartment, board, and washing.

SOUTHAMPTON, FREE EYE HOSPITAL.—House Surgeon. Salary £100 per annum, with board, lodging, and laundry.

SOUTH SHIELDS, INGHAM INFIRMARY AND SOUTH SHIELDS AND WESTOE DISPENSARY.—Junior House Surgeon. Salary £90 per annum, with residence, board, and washing.

SOUTHWARK UNION INFIRMARY, East Dulwich Grove, S.E.—Second Assistant Medical Officer. Salary £120 per annum, with board, lodging, and washing.

STOKE-ON-TRENT INFECTIOUS DISEASES HOSPITAL, Bucknall.—Resident Assistant Medical Officer (female). Salary £100 per annum, with apartments, board, washing, and attendance.

STOKE-UPON-TRENT UNION WORKHOUSE AND HOSPITAL, London-road, Newcastle, Staffs.—Assistant Resident Medical Officer, unmarried. Salary £130 per annum, with rations, apartments, and washing.

SUNDERLAND ROYAL INFIRMARY.—Senior Resident. Salary £150 per annum, with board and apartments.

TAUNTON AND SOMERSET HOSPITAL.—Senior House Surgeon. Salary £120 per annum, with board, lodging, and laundry. Also Resident Assistant House Surgeon for six months. Salary at rate of £80 per annum, with board, lodging, and laundry.

TRURO, ROYAL CORNWALL INFIRMARY.—House Surgeon, unmarried. Salary £100 per annum, with rooms, board, and washing.

WAKEFIELD GENERAL HOSPITAL.—Second House Surgeon, unmarried. Salary £100 per annum, with board, lodgings, and washing.

WESTERN GENERAL DISPENSARY, Marylebone-road, N.W.—Honorary Dentist.

WESTERN OPHTHALMIC HOSPITAL, Marylebone-road, W.—Two House Surgeons. Salary at rate of £50 and £40 per annum respectively.

WEST HAM UNION INFIRMARY, Whipps Cross-road, Leytonstone, N.E.—Third Assistant and Fourth Assistant Resident Medical Officer. Salary for Third Assistant £130 per annum and Fourth Assistant £120 per annum, with usual residential allowances in each case.

WEST LONDON HOSPITAL, Hammersmith-road, W.—House Physician for six months. Board, lodging, and laundry allowance provided.

WESTON-SUPER-MARE HOSPITAL.—House Surgeon, unmarried. Salary £120 per annum, with board and residence.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—Resident Medical Officer. Salary at rate of £100 per annum, with board, rooms, and laundry.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Sawston, in the county of Cambridge; and at Pontyberem, in the county of Carmarthen.

Births, Marriages, and Deaths.

BIRTHS.

TA'BOIS.—On May 11th, at Wickham-road, St. Johns, S.E., the wife of L. Ta'Bois, L.D.S., of a daughter.

MARRIAGES.

PHIPSON—STOTT.—On May 14th, at St. Michael-in-Lewes, Edward Selby Phipson, M.B., B.S. Lond., Captain, I.M.S., to Mary, younger daughter of Hugh Stott, J.P., M.R.C.S., L.R.C.P., D.P.H., Mayor of Lewes.

STRICKLAND—TANNER.—On May 14th, at Margam Abbey Church, Margam, Glamorganshire, by the Rev. Williamson, Harold Foster Strickland, F.R.C.S. Eng., to Georgina Tanner.

DEATHS.

DURANT.—On May 14th, Lieutenant-Colonel James John Durant, late I.M.S., of Terrycot, Warltersville-road, Crouch Hill, London, N., aged 83 years.

KERBY.—On May 14th, at Ivy House, Newbury, Robert John Kerby, M.D., in his 59th year.

NEW.—On May 19th, at 35, Harrington-square, London, George William New, M.R.C.S., L.R.C.P.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

HEALTH AND HOSPITALS IN BRITISH GUIANA.

A REPORT on the Blue-book of British Guiana for the year 1911-12 has been prepared by Mr. G. D. Bayley, Assistant Government Secretary. From this it appears that the estimated population of the colony is 295,784—153,441 males and 142,373 females. The birth-rate per 1000 of each of the different races representing the community was in 1911: Europeans other than Portuguese, 10·7; Portuguese, 25·9; East Indians, 26·0; Chinese, 32·5; Aborigines, 67·7; Blacks, 29·4; mixed races, 32·9. With the exceptions of Europeans, Chinese, and Blacks, which show decreases, an increase has been noted in respect of each race on the figures for 1910. Of the births registered, 3303, or 38·7 per cent., were legitimate, and 5227, or 61·3 per cent., illegitimate. The death-rate was 31·7 per 1000 of the estimated population. The mean rate for the previous five years was 32·2. The mortality amongst children under one year continues to be high—229 per 1000 births. The five principal causes of death throughout the colony during the past five years have been: malaria, 19·5 per cent.; pneumonia and bronchitis, 13·3; diarrhœal diseases, 12·9; kidney diseases, 7·5; and phthisis and other forms of tuberculosis, 6·2 per cent. There was no epidemic last year of any dangerous, infectious, or contagious disease, though the existence of plague in neighbouring places gave rise to considerable anxiety.

Anti-malarial and anti-mosquito measures are being generally and gradually enforced with visible signs of success. In 1906-07, 33,748 cases of malarial fever were treated in the sugar estates' hospitals; at the end of 1911-12 the numbers had fallen to 15,164. For the year under review there were 5235 fewer cases treated than in the previous year. Quinine has been for some years sold at all post offices to the general public at cost prices; it is also distributed by the sugar estates free to their labourers. Prisoners, members of the police force, the inmates of the industrial school and the orphan asylum, and attendants at the public institutions are also supplied by the colony with free quinine. Ankylostomiasis, which has engaged the attention of the Medical Department for several years, has considerably decreased on the sugar estates; this is due to improved sanitary measures and the erection of latrines. A mosquito census for the city of Georgetown was taken by the Government bacteriologists; this census showed the enormous number of mosquito breeding grounds and the necessity for a more vigorous campaign against the mosquito. The total rainfall for the calendar year 1911 at the Botanic Gardens, Georgetown, was 87·89 inches. The average maximum temperature in the shade was 85·4° F., and the average minimum 74·6°. There are five public hospitals in the principal centres of population, and the outlying districts are served by dispensary hospitals and dispensaries. The immigration law also requires the maintenance of hospitals on every plantation on which there are indentured East Indian labourers, and those institutions are available for the treatment of emergency and pauper cases from the general community. There were 758 patients in the public hospitals at the beginning of the year, and 17,185 were admitted during the year. The daily average was 697. There were 1952 deaths. Outdoor treatment was given to 83,009 persons. At the leper asylum there were 422 patients (299 males and 123 females) when the year began, and during the year 139 were admitted.

THE GERMAN ANTI-ALCOHOL ASSOCIATION.

To the Editor of THE LANCET.

SIR,—May I point out that the report of your Berlin Correspondent (May 10th, p. 1351) would be more interesting if the extravagant statements of the members of the above association had defined the quantities of alcohol that caused the commission of offences stated. In my studies of alcohol I have never found that strictly moderate consumption daily ever had any tendency to "æsthetic and sentimental contemplation of the world instead of a moral and practical one."

The report also states that 30,000 people were sent to the asylum for alcoholism. As junior medical officer at a large asylum I studied this cause and found that in most of the cases so sent the lesions of the brain were the cause of the alcoholism, not the alcoholism the cause of the insanity. The statistics were therefore erroneous.

I am, Sir, yours faithfully,

New Cavendish-street, W., May 14th, 1913. THOMAS DUTTON.

ST. LUKE'S HOSPITAL, CHEMULPO, KOREA.

AS was stated in THE LANCET of April 26th (p. 1213) missionary hospitals may be in a sense the outposts of medical science. The report of St. Luke's Hospital, Chemulpo, for 1912, is interesting reading, but is lacking in details of the professional work. A medical report dealing with local diseases and the variations of disease under an environment totally dissimilar from that in the West would be useful. The Koreans, it is stated in the present report, have long been ready to go to foreign medical men in surgical cases, but not for diseases requiring medical treatment, for which they still cling to the old-style native practitioner. The itinerant nostrum vendor is becoming a curse in the country. Appendicitis and heart disease seem to be on the increase—though far less common than at home, acute rheumatism being also very rare. Abdominal emergencies are infrequent. Fevers of various kinds are met with, but the ordinary ones of childhood are usually only heard of, not seen. Naturally, with only one medical man as house physician, house surgeon, and visiting staff, the hospital system has to be very elastic. The Oriental deliberation, like the Spanish "mañana" in Latin America, creates much difficulty. One of the opportunities afforded by mission hospitals—that of trying to discover more about the hitherto undescribed fevers—is recognised in the report, but seems to be impossible for lack of assistance, for financial conditions do not permit otherwise. Expenses are increasing, while the changing economic conditions under the new *régime* in the country are making the poor poorer. Though there is a small balance on the year's working, subscriptions and grants are urgently needed. The hospital contains two male wards of 13 beds and 12 beds respectively, a female ward of eight beds, two small private one-bed rooms, and three cots. Besides the medical officer, Dr. H. H. Weir, the European staff consists of Mrs. Weir, lady superintendent and nurse, a lady nurse, and a lady dispenser, while the Korean staff of helpers numbers nine. The total number of in-patients during 1912 was 368, of out-patients 6848. The operations numbered 132. Grants are made by the Society for the Propagation of the Gospel and the Hospital Naval Committee. Subscriptions and donations may be sent to the Rev. S. J. Childs Clarke, 5, Amen-court, London, E.C., marked "St. Luke's Hospital," or to Captain J. H. Corfe, R.N., Junior United Service Club, S.W., for the Hospital Naval Fund.

DIFFUSED ARTIFICIAL LIGHT.

UNDER the heading of "Light Run Amok" in an annotation in our issue of March 1st, 1913, we commented upon the objection to most modern systems of artificial lighting that they are usually "direct" instead of "indirect," whereas the actual source of light should be invisible to the eye, and only the effects of its reflection seen upon the objects in the diffused light stream. The matter is of considerable importance in connexion with the use of artificial light and the question of eye-strain and other eye troubles. This view has received endorsement by the Electrical Engineering and Equipment Company, Limited, of Bank Buildings, 109-111, New Oxford-street, London, W.C., who have introduced the "Indra" system of lighting adapted chiefly to illuminating by means of electric lamps. In this system the actual source of light is not seen, yet the bulk of the light is reflected directly through clear glass. In their own words, "a simple fitting consists of a combination of specially designed, upper reflector and lower distributor. The upper reflector is preferably of opal glass, but in some cases, where the whole of the light is required in a downward direction, an aluminium reflector is supplied. The lower plate is provided with alternating rings of clear and etched glass. The etched glass rings are at right angles to the direct rays from the lamp, and are of translucent or etched glass, while the clear glass rings are arranged in such a manner that the rays of light reflected from the top reflector pass straight through." It happens that most of the rays from the metal filament lamp emanate at right angles to the filament. These rays strike the reflector and are directed through the clear glass rings of the distributor. As to the rays which strike directly on the distributor, they are diffused through the translucent or etched surface glass rings, producing an efficient illumination which is agreeably diffused, the eye being saved from the strain caused by light issuing direct from the filament. We have made practical trials with the "Indra" shades in domestic rooms, and have found that they give the agreeable effects of illumination which are claimed for them. In four words, there is no glare.

AN ULTRA-VIOLET RAYS OUTFIT.

THE action and effects of the ultra-violet rays are attracting such interest at the present time that experimentalists in this field will be glad to learn of a silica lamp laboratory outfit which has been put upon the market by the Westinghouse, Cooper, Hewitt Co., Limited, of 80, York-road, King's Cross, London, N. We have examined a specimen lamp in our laboratory, and find that it is not only an efficient producer of the ultra-violet rays, but that it is quite easy to "rig up" and manageable to run. It consists of a quartz tube containing mercury hung upon a special frame provided. A resistance coil is supplied which enables the voltage to be adapted to the particular requirements of the lamp. A number of very interesting experiments can be made with this lamp, as, for example, the examination of fluorescent substances (which in many instances give a gorgeous response), the determination of the bleaching effect on colours, the investigation of the sterilising power of the ultra-violet rays, and so forth. Other practical studies suggest themselves in which the use of a silica lamp

laboratory outfit would obviously be of service. It is well to point out that when operating with this lamp the eyes and skin should be protected from the rays. This can be done by screening the lamp with a sheet of ordinary glass. It will be remembered that the efficiency of the silica lamp is due to the fact that quartz is transparent to the rays, whereas glass is opaque, and therefore glass tubes are not available for the purpose. The light is very intense.

Dr. D.—It is not easy to reply to this question. Much depends on the nature of the bills paid and the circumstances attendant thereon. Any correspondence on the subject past or present, with the bills and particulars as above, should be put before our correspondent's legal adviser for his opinion.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Prof. A. B. Macallum: Acineta Tuberosa: a Study on the Action of Surface Tension in Determining the Distribution of Salts in Living Matter.—Surgeon-General Sir David Bruce, Major D. Harvey, Major A. E. Hamerton, and Lady Bruce: Morphology of Various Strains of the Trypanosome causing Disease in Man in Nyasaland. IV., The Mzimba Strain.—Helen L. M. Pixell: Notes on Plasma Gondii (communicated by Prof. H. A. Minchin).—Mr. J. C. F. Fryer: An Investigation by Pedigree Breeding into the Polymorphism of Papilio Polytes. Linn. (Communicated by Prof. J. S. Gardiner.)—Dr. S. Russ and Dr. Helen Chambers: On the Action of Radium Rays upon the Cells of Jensen's Rat Sarcoma (communicated by Mr. H. G. Plimmer).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY.

SECTION OF ODONTOLOGY (Hon. Secretaries—Stanley P. Mummery, Robert McKay): at 8 P.M.

Annual General Meeting.—Election of Officers and Council for Session 1913–1914.

Casual Communications:

Mr. W. W. Gabell: Abnormal Extension of the Antrum (Unilateral).

Mr. L. A. Harwood: Odontome (?) in Premaxilla.

Mr. G. C. Birt: Fusion of Maxillary Molars.

Paper:

Mr. A. Hopewell-Smith: The Structure of the Dental Pulp in Ovarian Teratomata.

Discussion

On Mr. W. W. James's Paper on the Cure of Mouth Breathing. (Adjourned from the last Meeting.)

Preliminary note for June Meeting:—This Meeting will be held on Monday, June 23rd, at the Royal College of Surgeons, when the Curator of the Odontological Museum, Mr. J. F. Colyer, will give a Demonstration on the Recent Additions to the Museum, after which the Museum will be open for inspection.

TUESDAY.

SECTION OF MEDICINE (Hon. Secretaries—Robert Hutchison, H. Batty Shaw): at 5.30 P.M.

Annual General Meeting.—Election of Officers and Council for Session 1913–1914.

Paper:

Dr. H. A. Lediard: Cases of Chyliform Effusion.

To be followed by a discussion on the Chemistry of these Effusions, opened by Dr. Mackenzie Wallis.

SECTION OF PSYCHIATRY (Hon. Secretaries—R. H. Cole, Bernard Hart): at 6 P.M.

Annual General Meeting.—Election of Officers and Council for Session 1913–1914.

WEDNESDAY.

SECTION OF THE HISTORY OF MEDICINE (Hon. Secretaries—Raymond Crawfurd, D'Arcy Power): at 5 P.M.

Annual General Meeting.—Election of Officers and Council for Session 1913–1914.

Dr. Chowry Muthu: The Ancient Systems of Indian Medicine.

Dr. Galloway: The Priory of Ronceval at Charing, Middlesex (illustrated by lantern slides).

Dr. Nixon: Further Notes on Thomas Dover.

Mr. Macleod Yearsley: (1) Two Relics of John Avery, F.R.C.S. Eng., sometime Surgeon to Charing Cross Hospital; (2) Elegant Medical Prescriptions for Various Disorders by Dr. Hugh Smith, 1796.

SATURDAY.

SECTION OF BALNEOLOGY AND CLIMATOLOGY (Hon. Secretary—Charles Buckley).

Provincial Meeting at Bournemouth.

Annual General Meeting.—Election of Officers and Council for Session 1913–1914.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY.—8.30 P.M., Annual Conversazione. 9 P.M., Oration:—Sir Wm. Whitla, M.D.: The Trend of Thought in Recent Pharmacological Research.

AL SOCIETY OF ARTS, John-street, Adelphi, W.C.

THURSDAY.—4.30 P.M., Sir John Benton, K.C.I.E.: Irrigation Works in India.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.

MONDAY.—4 P.M., Dr. J. M. H. MacLeod: Clinique (Skin). 5.15 P.M., Lecture:—Dr. A. J. Jex-Blake: Influenza, Bronchitis, and Tuberculosis of the Lungs.

TUESDAY.—4 P.M., Dr. G. N. Pitt: Clinique (Medical). 5.15 P.M., Lecture:—Dr. R. A. Young: The Diagnosis of Basic Lung Conditions.

WEDNESDAY.—4 P.M., Mr. T. P. Legg: Clinique (Surgical). 5.15 P.M., Lecture:—Dr. T. W. Eden: Some Clinical Forms of Acute Pelvic Inflammation.

THURSDAY.—4 P.M., Mr. A. Carless: Clinique (Surgical). 5.15 P.M., Lecture:—Mr. J. J. Clarke: Open Operations in Simple Fractures.

FRIDAY.—4 P.M., Mr. E. A. Peters: Clinique (Ear, Nose, and Throat). 5.15 P.M., Lecture:—Dr. W. Wingrave: Polypi.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—10 A.M., Dr. Simson: Diseases of Women. 10.30 A.M., Medical Registrar: Demonstration of Cases in Wards. 12 noon, Dr. Bernstein: Pathological Demonstration. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Armour: Operations. Mr. Dunn: Diseases of the Eye. 5 P.M., Lecture:—Mr. Baldwin: Common Diseases of the Rectum.

TUESDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 10.30 A.M., Surgical Registrar: Demonstration of Cases in Wards. 12 noon, Mr. T. Gray: Demonstration of Fractures. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Diseases of the Skin. 5 P.M., Lecture:—Mr. Baldwin: Common Diseases of the Rectum.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. 11 A.M., Mr. Souttar: Demonstration of Minor Operations. 12 noon, Mr. Souttar: Abdominal Diagnosis. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women. 5 P.M., Lecture:—Mr. Baldwin: Common Diseases of the Rectum.

THURSDAY.—10.30 A.M., Dr. Simson: Gynæcological Demonstration. 12.15 P.M., Lecture:—Dr. G. Stewart: Neurological Cases. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Armour: Operations. Mr. Dunn: Diseases of the Eye. 5 P.M., Lecture:—Mr. Baldwin: Common Diseases of the Rectum.

FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 10.30 A.M., Lecture:—Dr. Owen: Practical Medicine. 12.15 P.M., Lecture:—Dr. Bernstein: Clinical Pathology. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Diseases of the Skin. 5 P.M., Lecture:—Mr. Baldwin: Common Diseases of the Rectum.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Diseases of the Eye. 10.30 A.M., Surgical Registrar: Demonstration of Cases in Wards. 12 noon, Mr. Souttar: Surgical Anatomy of the Abdomen. 2 P.M., Medical and Surgical Clinics. Mr. Pardoe: Operations.

LONDON SCHOOL OF CLINICAL MEDICINE, Dreadnought Hospital, Greenwich.

MONDAY.—Out-patient Demonstrations:—10 A.M. Dr. Singer: Medical. Mr. H. Curtis: Surgical. 12 noon, Mr. G. N. Biggs: Throat, Nose, and Ear.—2.15 P.M., Mr. W. Turner: Surgery. 3 P.M., Mr. W. Turner: Operations. 3.15 P.M., Sir Dyce Duckworth: Medicine. 4.15 P.M., Mr. R. Lake: Ear and Throat.

TUESDAY.—Out-patient Demonstrations:—10 A.M., Dr. G. Holmes: Medical. Mr. Cole: Surgical. 12 noon, Dr. H. MacCormac: Skin.—2 P.M., Mr. L. McGavin: Operations. 2.15 P.M., Mr. R. Carling: Surgery. 3.15 P.M., Dr. G. Rankin: Medicine. 4.15 P.M., Sir Malcolm Morris: Skin.

WEDNESDAY.—Out-patient Demonstrations: 10 A.M., Dr. F. Langmead: Medical. Surgical. 11 A.M., Mr. R. E. Bickerton: Eye.—2 P.M., Mr. L. V. Cargill or Mr. Choyce: Operations. Dr. A. Davies: Pathological Demonstration. 2.15 P.M., Dr. F. Taylor: Medicine. 3.15 P.M., Mr. Cargill: Eye Clinique. 4.30 P.M., Mr. C. C. Choyce: Surgery. 3.15 P.M., Special Lecture:—Mr. L. V. Cargill: The Treatment of Ocular Injuries.

THURSDAY.—Out-patient Demonstrations:—10 A.M., Dr. Singer: Medical. Mr. H. Curtis: Surgical. 12 noon, Mr. G. N. Biggs: Throat, Nose, and Ear.—2 P.M., Mr. R. Carling or Mr. W. Turner: Operations. 3.15 P.M., Dr. R. Wells: Medicine. 4.30 P.M., Special Lecture:—Dr. R. O. Moon: Functional Disorders of the Heart.

FRIDAY.—Out-patient Demonstrations;—10 A.M., Dr. G. Holmes: Medical. Mr. Cole: Surgical. 12 noon, Dr. H. MacCormac: Skin.—2 P.M., Mr. L. McGavin: Operations. 2.15 P.M., Sir John Rose Bradford: Medicine. 3.15 P.M., Mr. L. McGavin: Surgery. 2.15 P.M., Lecture:—Sir John R. Bradford, K.C.M.G.: Ascites.

SATURDAY.—Out-patient Demonstrations: 10 A.M., Dr. F. Langmead: Medical. Surgical. 11 A.M., Mr. R. E. Bickerton: Eye.—10 A.M., Radiography.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patient (Mr. E. Gillespie). 2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Nose, Throat, and Ear (Mr. H. D. Gillies). 3 P.M., Clinical Pathology and Pathological Demonstration (Dr. W. H. Duncan).

TUESDAY.—Clinic; 2.30 P.M., Operations. Clinics:—Medical Out-patient (Dr. A. G. Auld); Surgical (Mr. Howell Evans); Gynæcological (Dr. A. E. Giles). 3.30 P.M., Medical In-patient (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2 P.M., Throat Operations (Mr. Gillies). 2.30 P.M., Children's Out-patient (Dr. T. R. Whipham); Skin (Dr. G. N. Meachen); Eye (Mr. R. P. Brooks). 3 P.M., X Rays (Mr. W. Steuart); Clinical Pathology and Pathological Demonstration (Dr. W. H. Duncan). 5.30 P.M., Eye Operations (Mr. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. B. Giles). Clinics:—Medical Out-patient (Dr. A. J. Whiting); Surgical (Mr. Carson). 3 P.M., Medical In-patient (Dr. G. P. Chappel).
FRIDAY.—2.30 P.M., Operations. Clinics:—Medical Out-patient (Dr. A. G. Auld); Surgical (Mr. E. Gillespie); Eye (Mr. R. P. Brooks). 3 P.M., Medical In-patient (Dr. R. M. Leslie); Clinical Pathology and Pathological Demonstration (Dr. W. H. Duncan).

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, S.W.
WEDNESDAY.—4.30 P.M., Lecture:—Dr. C. Miller: The Site of Tuberculous Lesions at Different Ages.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C.
TUESDAY.—3.30 P.M., Clinical Lecture:—Dr. F. Batten: Cerebellar Disease.
FRIDAY.—3.30 P.M., Clinical Lecture:—Mr. D. Armour: Tumour of the Spinal Cord.

QUEEN'S HOSPITAL FOR CHILDREN, Board Room of the Hospital, Hackney-road, N.E.
MONDAY.—4 P.M., Mr. D. Drew: Demonstration of Selected Surgical Cases.

THE THROAT HOSPITAL, Golden-square, W.
MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.
THURSDAY.—6 P.M., Dr. W. Griffith: Syphilis and its Treatment.

ANCOATS HOSPITAL, Manchester.
THURSDAY.—4.15 P.M., Mr. J. Morley: Stricture of the Urethra. (Post-Graduate Clinic.)

ROTUNDA HOSPITAL POST-GRADUATE COURSES, Dublin.
MONDAY.—10 A.M., Obstetrical Lecture: The Induction of Labour. 11 A.M., Examination of Patients and Minor Operations.
TUESDAY.—10 A.M., Major Operations. 4 P.M., Class in Gynæcological Diagnosis.
WEDNESDAY.—10 A.M., Obstetrical Lecture: The Various Methods of Effecting Cervical Dilation. 11 A.M., Examination of Patients and Minor Operations.
THURSDAY.—10 A.M., Major Operations.
FRIDAY.—10 A.M., Gynæcological Lecture: Genital Malformations. 11 A.M., Examination of Patients and Minor Operations. 4 P.M., Class in Gynæcological Diagnosis.

For further particulars of the above Lectures, &c., see Advertisement Pages.

A DIARY OF CONGRESSES.

WE shall publish this diary from time to time that our readers may have under their hands the dates of the approaching scientific Congresses. It is unnecessary to issue the lists of all these functions week by week, and we propose to make only such gatherings as will occur in the immediate future the subject of regular announcement. The following Congresses, Conferences, and Exhibitions are announced:—

April 26th–Nov. 5th (Ghent).—International Exhibition.
May 18th–31st (London, Holland Park Rink).—National Health Exhibition.
,, 22nd–June 7th (London, Olympia).—Royal Naval and Military Tournament.
May–October (Leipzig).—First International Building Exhibition.
June 11th (opens) (London, Crystal Palace).—Anglo-German Exhibition.
,, 16th and 17th (Minneapolis).—Fifteenth Annual Meeting of the American Proctologic Society.
,, 17th–20th (Minneapolis).—American Medical Association.
,, 24th (opens) (London).—Historical Medical Museum. (Organised by Mr. Henry S. Wellcome.)
,, 24th–27th (London, Ontario).—Canadian Medical Association.
,, 26th–28th (Oxford).—Fourth Annual Conference of the British Hospitals Association.
,, 27th (London, Inns of Court Hotel).—Conference of the Pure Food and Health Society of Great Britain.
,, 30th and July 1st (London, Guildhall).—Conference on Diet, Cookery, and Hygiene in Elementary Schools and Institutions.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 21st, 1913.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
May 15	30·15	N.E.	...	103	61	47	47	51	Fine
,, 16	30·05	N.E.	...	109	66	45	45	47	Overcast
,, 17	29·74	E.	...	112	71	42	49	53	Fine
,, 18	29·86	N.W.	...	106	62	45	49	52	Cloudy
,, 19	29·98	N.W.	...	115	60	43	46	51	Cloudy
,, 20	30·08	SSW	0·02	107	62	45	49	50	Cloudy
,, 21	30·12	S.W.	...	116	66	50	51	56	Cloudy

The following journals, magazines, &c., have been received:—South African Medical Record, British Journal of Dermatology, Revue de Chirurgie, Revue de Médecine, Revista de la Sociedad Médica Argentina, Science Progress, Annali di Medicina Navale e Coloniale, Tropical Diseases Bulletin, Dublin Journal of Medical Sciences, Albany Medical Annals, Canadian Practitioner, Therapist, Pædiatrics, St. Paul Medical Journal, Canadian Medical Association Journal, Pacific Medical Journal, Birmingham Medical Review, Cleveland Medical Journal, Archives Internationales de Neurologie, Revue de Gynécologie, Medico-Legal Journal, American Journal of Obstetrics, Clinique Infantile, American Medicine.

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